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AND DEVELOPMENT COMMISSION

ENERGY EFFICIENCY COMMITTEE

WORKSHOP

POTENTIAL APPLIANCE EFFICIENCY REGULATIONS

FOR GENERAL SERVICE AND REFLECTOR

INCANDESCENT LAMPS AND HALIDE LUMINAIRES

CALIFORNIA ENERGY COMMISSION

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I N D E X

P R O C E E D I N G S

PRESIDING MEMBER PFANNENSTIEL: This is a Committee Workshop, and Energy Commission Committee Workshop on Potential Appliance Efficiency Regulations for General Service and Reflector Incandescent Lamps and Metal Halide Luminaires.

I am Commissioner Jackie Pfannenstiel, the Chair of the Energy Commission's Energy Efficiency Committee. To my left is Commissioner Rosenfeld, also on the Energy Efficiency Committee.

The point of this workshop is to consider additional lighting standards beyond those that the Energy Commission adopted December 15, 2004. We have been the, at the time that the Commission adopted the standards in December, the Commission directed the Energy Efficiency Committee, which is Commissioner Rosenfeld and myself, to consider adopting additional lighting standards. There were some issues at the time of the staff as well as our advisors, Tim Tutt who is to my right and John Wilson who is to Commissioner Rosenfeld's left, have been working various parties involved in this proceeding to try to

reach agreement on the different issues that were raised at that time.

I think there has been a lot of progress made, and this is a workshop intended to put the progress on the table in front of us all and see if we can then reach some agreement on standards that will go back to the Energy Commission for adoption.

I want to make one point in terms of what I think is a critical aspect of the standards. That is customer's role in all of this. Efficiency standards by statute need to be cost effective, technically feasible, and in my mind they need to be understandable to the ultimate customer.

I do think that has been an issue that has been raised with the lighting standards to make sure that the customers know what they are getting when they buy more efficient light bulbs. So, it is a very major part of what we have been working with the parties on over these past couple of months. I think we've made some progress in all areas that have been raised.

With that, I think I turn it over to Tim. Take it Tim.

MR. TUTT: Welcome, everyone. One other thing to note. I understand that Joe Howley and Cassie Gilson will be arriving late, that Joe is flying in this morning. We will try to get all of the important stuff in before they come.

As Commissioner Pfannenstiel suggested or said, we are talking here today about potential appliance efficiency regulations for lights, lamps, whichever you want to call them in three general areas: general service incandescent lamps, reflected incandescent lamps, and metal halide luminaires.

We considered standards for these areas of appliances last year, and in fact, adopted some Tier 1 standard as you all know for general service incandescent lamps and some standards for metal halides. At the time, we decided to step back from some of the other standards we were adopting and engage in a process of dialogue with the industry to try to better understand what our standards would do, how they would work in the market, and work with the industry as much as we could to come up with a better alternative than we had proposed last fall.

We feel like we are there. We have

talked to the industry in many meetings. We have also talked with Wally McGuire of Flex Your Power about a marketing opportunity for these in effect new models of lights that will hopefully be coming out in response to this as part of this effort.

We are encouraged by the collaborative discussion we've had so far and the partnerships we are forming, and we want to move forward to try get some key and clear energy savings in this sector.

The Tier 1 requirements for general service incandescent lamps were requirements that many bulbs on the market already could meet and were adopted last fall, I'm sorry December 15. The effective dates for those standards is January of next year.

What we didn't adopt last year were any standards for enhanced spectrum or vibration service lamps. We still don't have standards proposed for vibration service lamps, but we are proposing standards for enhanced spectrum here.

In effect, what we are doing is considering them as a separate category of lamps where as last fall we were considering them together with all general service incandescents,

and so the standard we propose here today make it a little easier for general service or enhanced spectrum lamps to continue to be part of the market.

We engaged in discussions with the industry. One of the issues that was raised there was the question of the fact that consumers tend to buy or are used to buying lamps in these categories, 25 watts, 60 watts, 75 watts, etc.

One result of a standard might be that consumers would continue to seek product in those categories with higher lumens and continue buying those lamps with higher lumens but same wattage. In effect, you would have efficacious lights, but you wouldn't necessary get energy savings because you have the same watts going out into the market.

You can imagine all kinds of scenarios about consumers since they have more light coming out of their fixtures, turning them off more, or turning some lights on and off and get into some pretty esoteric discussions of whether there really energy savings there or not.

In fact, we understood the argument that there were these wattage categories that are sort of ingrained in the market from decades of

consumers being used to them. We tried to come up with standards that would result hopefully in lower wattage bulbs being developed to meet the standards rather than higher lumens bulbs.

I won't go into much detail with those except I'll tell you that Chris Calwell is going to present more of the details of that standard structure in his presentation.

MR. FLAMM: Tim, on the agenda, Chris was before this, do you want to jump in with him, or do you want to continue this?

MR. TUTT: No, I will continue, and then Chris can come after me.

The goal is to reduce energy and increase efficacy. We want to maintain the lamp light, we don't want to have lamp structures, lamps being developed which really just reach efficacy goals or standard goals by reducing the lamp light. I understand that might also be a concern, and one of the questions I believe is in Chris' revised case study, which is available at the back table, is a point that the Energy Commission may wish to require a certain minimum lamp light in some cases. We can talk about that further today. It is not in our proposed standard

at the present.

This is an example of how the structure works for a 60-Watt soft white bulb. I just had a range of lumens on the lefthand column there, standard sets of lumens for a variety of bulbs on the market, and their efficacy is right next to that.

Now, the way the standards that we are proposing work, at these levels of lumens, the standard would limit your maximum wattage to 57 watts for soft white bulbs. That is about a 5.3 percent reduction from the 60-watt level. A 5.3 increase in efficacy as a result if the lumens remain the same.

Now at the same time, if you want to keep a 60-watt bulb and just increase lumens to meet the standards, in effect, for each of these sort of standard bulbs out on the market right now, you would be having to get a 10 to 25 percent increase in efficacy to manufacture a 60-watt bulb with higher lumens to meet the same standards.

This chart illustrates in a simple form what we are really intending is to make it easier to meet the standards by reducing wattage than by increasing lumens at the same wattage.

The next chart is an example of the standards and the previous Tier 1 standards, Chris is going to go into that in more detail later, so I will just pass on.

In the staff report, there are tables for general service incandescent lamp standards. This is the equations behind the standards, behind those ramps that we have in the charts.

A couple of things on here, one is it looks complicated, but really it is fairly simple for most of the standard types of bulbs out there on the market. As an example, between 700 and 950 lumens, the standards basically say, and this is I think for clear, I can't remember, but --

MR. FLAMM: Frost or clear, yes.

MR. TUTT: -- the maximum wattage is limited to 57 1/2. It is that simple for that category of lumens.

The other thing I would like to point out on this is that we are cracking the standards equations in the form of lumen categories rather than watt categories. Our intent there is to start giving the stakeholders in the infrastrucutre in the market to move towards thinking about things in terms of lumens rather

than in terms of watts.

We know that is a difficult market change. This is not aimed obviously at consumers, but it is aimed at the industry, the retailers, people that buy them have to pay attention to standards as they are buying and start thinking about these things in terms of lumens and hope to start the change going in that direction.

While we at some point in the future work with Wally McGuire and others to get consumers to think about things in this way as well.

Next slide. This is a similar chart for soft white. I am not going to go into detail on this. They are in the staff report, and the table is in the staff report, the chart is in Chris' report and the staff report I believe. So, just to keep on going, this is our new we have a separate category now for enhanced spectrum.

There aren't many lamps out on the market for enhanced spectrum compared to the other categories. Perhaps one reason why we didn't separate it out previously, but since they are out there on the market, we decided to have a separate standards category for it, and you will see again

that we have the ramping instruction where it can be even for enhanced spectrum lights then to induce manufacturers in the industry to come down in wattage rather than increase lumens, rather than effectively prohibit by standard the bulbs from being on the market all together, we are saying keep them, but bring the wattage down.

I think that is the chart for the spectrum of the table that's in the staff report.

Just to switch, and we will talk about these in separate probably discussions one by one this afternoon or later on today, but for incandescent reflector lamps, we did not adopt standards last fall. We had an implementation date for the proposed standards, January 1, 2006, and we did not adopt those standards last year, as I said, and the proposed standards that we have here today are the same as those with three changes.

First, the effective date for those standards is delayed until January of 2007, a one year delay. The lowest wattage category has changed from 40 watts, beginning at 40 watts to beginning at 41 watts, which effectively means that 40 watt and below bulbs are exempted from the

standards.

Finally, the one specific bulb, the 50ER30 lamps are exempted from the standards, which was a recommendation as a possible thing to consider last year as well, which we had not taken up at the time, but we had decided to take up in these proposed standards. These are the standards for these incandescent reflector lamps.

The third category of luminaires or lamps that we are talking about today is metal halide luminaires. Again, last fall had proposed a variety of standards for metal halides including probe-start versus pulse-start for horizontal as well as for vertical lamps. We delayed some of those. We also delayed the electronic ballast standards that we had proposed last fall.

We are now moving forward with some of those, again, with some changes. All of the metal halide luminaires we are expecting to include pulse-start ballasts by January 1, 2008, vertical ones by the beginning of next year, and all of them including the horizontal ones by January 2008.

For ballasts, the ballast standard is developed in the form of an efficiency requirement

which in effect I think in today's market requires electronic ballasts rather than magnetic ballasts and we are proposing to adopt those standards with sort of ramps as to when they are effective for different sizes of lamps.

For 150 to 200 watts, so the smaller and common category, they would be adopted and effected as of January 1, 2008. For all other of metal halide luminaires it would be January 1, 2009 up to 500 watts. Above 500 watts and below 150 watts, there is no standard proposed, is that right?

MR. FLAMM: That's correct.

MR. TUTT: Again, there is some changes here in terms of from the standards proposed last fall in terms of dividing the luminaires up into size categories and phasing the standards in at different dates.

That is it for the overview of the standards. I hope that you all have had time to go through the staff report to some degree and Chris' revised case study to some degree, and Chris will provide you with more information in the presentation right now about how we develop these standards and what they really mean out

there.

MR. CALWELL: I am wondering if we could ask to turn these lights down here just because we are getting some wash on the screen. Is that easy enough to catch those spots. That's great. Thank you very much.

What I am going to do is run through a little bit of technical background. I apologize, it will be somewhat redundant for folks who came to the meeting in January, but it looks like the timing is perfect. We've just been joined by our colleagues. Let's go ahead and go on to the next slide.

This is a photograph of six different sample incandescent products you can find in the store, all from one manufacturer and all nominally 60 watts or close to it. We just put them in to illustrate the range of choices a consumer might have when trying to decide how to meet their lighting needs.

You have essentially the basic 60-watt lamp here, one that has been enhanced a little bit in its packaging and in its functionality to be soft white. The is the miser bulb which is lower in wattage, but also lower in light output.

Here is a long-life lamp which is the same in wattage, but lower in light output and longer in lifetime.

Then an enhanced spectrum product here, and then a halogen product here in a smaller form factor.

I just wanted to give you a sense of the range of options, even within the same nominal wattage and within one manufacturer.

Here is an example of a couple of more efficient incandescent products that are marketed in slightly different ways. This Westinghouse product here is longer life, identical wattage, and substantially brighter, so this is sort of an example of the case that Tim raised before about what happens if manufacturers just go to higher light output but the same wattage. Then some energy saving incandescent products from Fike over here.

Notice here they have gone to lower wattage, so 34 to replace a 40, 52 to replace a 60, 67 to replace a 75, and 90 to replace 100.

Next slide. Just for background, Tim gave you some of the Tier 1 standards that are going to take effect in January of 2006, the Tier

2 standards, we are pending additional discussion. The stakeholder meeting we held in Davis in January of 2005, I recognize some familiar faces from that meeting. We talked a lot there about the krypton lamp analysis and also about some opportunities for California to help market the more efficient incandescent lamp prior to the Tier 2 standards taking effect.

My understanding, and we can get into it later today, but I think a number of utilities are already contemplating what they might do there beginning as early as 2006.

Industry concerns were raised about the standard leading to brighter lamps of identical wattage, and so ECOS and PG&E reformulated our Tier 2 proposal to produce these steps that Tim described.

We also by the way went back to all the catalogs and keyed in brand new data from all the manufacturers, and the reason was we were alarmed to discover that we started this whole process in late 2001 or early 2002, and now some three years later there were probably some new products on the market and some old ones that weren't there anymore. The charts I will show you do have the

most current data we could find from the manufacturer's websites.

Next slide. You are going to lose me on the transcript if I walk up here?

COURT REPORTER: There are mikes up there.

MR. CALWELL: Let me see what I can do to help explain the charts here. Let me just illustrate a few points here. This is a sample chart for soft white lamps only. What we've got are watts plotted on the vertical axis, lumens on the horizontal. The lamps that don't need the proposed Tier 2 are all shown in these gray diamond. Basically to the left and above the line.

Here you see the Tier 1 line already adopted by the California Energy Commission. Everything to the right of it or below it would qualify. The dotted line right here represents the original Tier 2 proposal that the Commission considered and deferred in December of 2004.

What we tried to do with this step approach is recommend something which on average is roughly as stringent as a straight line, but goes in some cases slightly more stringent and

some cases slightly less stringent, essentially criss crossing the line as it rises.

Then any of the lamps that currently exist that we found to be more efficient than that spec line or shown as red diamond, you can see them here and here. Then we also took the academic research from the 70's and some newer findings by manufacturers and calculated for the most commonly sold lamps of each wattage, how would a krypton bulb perform.

Here you see this yellow square dropping from the most common 100-watt bulb, this one from the most common 75, 60, and 40. In effect, that was a reality check to say would the standard as drawn allow a krypton technology to comply. That is the soft white version. Let's take a look at the others.

Here I have just listed for you of all the current manufacturer catalogs, these are the models that we found that would comply under soft white. You can see in this case that the entries are dominated by General Electric. There are a few from Sylvania and Westinghouse.

Let's take a look now at frosted and clear. A larger number of lamp models shown here,

but the same exact format. These are your non-qualifying lamps, Tier 1, old Tier 2, new Tier 2. Here you see a larger number of compliant products, the red diamonds. Again, the krypton lamps -- excuse me, here, here, here, and here clearing the line by a few watts in each case.

Next slide. So, here is the list of compliant frost and clear lamps and competitive dynamic shift a little bit. In this case, a very small number of General Electric products, but a large number of Philips and Sylvania products.

Between the two major standards, there is broad representation of compliant manufacturers. It is also interesting to note that most of the lamps that qualify have in their name something related to saving power or saving energy, so it suggests that the standard is sensitive to efforts manufacturers have already made to improve efficiency, but that more could obviously be done with the models that don't yet comply.

The next slide. Here is the enhanced spectrum specification. More challenging, of course, simply because there is not as many models to base it on. We found one highly efficient

sample out here, and then showed what krypton would be expected to do at each of these four wattage categories. If there are more data points for enhanced spectrum, we would love to have them. This is simply the data set we could find.

Curiously enough, a lot of enhanced spectrum lamps sold in natural food stores by third party or less well-known manufacturers often don't even quote lumens. They will quote watts but not always lumens on the package. It makes it very hard to know how they would perform without going out and testing them.

The next slide. This was simply the Tier 2 line as drawn before for soft white, but we showed where the enhanced spectrum lamps would fall. That is the triangles there, there, there, there. What you see are a few of them would meet the Tier 1, but none of them would meet the Tier 2, that is why we suggested pulling them out as a separate specification.

Next slide. This is the same slide I showed back in January, but I just wanted to illustrate we are here talking somewhat heavily focused on krypton today, but in reality, there are a variety of technologies manufacturers might

use. The standard does not compel the use of krypton, it doesn't even say that it is preferred, it is simply the one that got the most analysis because it seems to be the most straightforward.

Coiled coils are already routinely used with filaments. I will show you in a minute an example of how lamps could be tuned for greater efficiency, but shorter life.

Many many lamps are sold with a diffused coding, but end up in an application where the bulb itself is never visible to the user. It is behind a shade or its own diffuser, so one could imagine simply increase coding transparency for some of them would improve efficiency.

Here is the krypton xenon option, xenon being much more expensive, but krypton is the primary focus.

Infrared reflective halogen was the subject of a lot of work at Lawrence Berkeley Labs and other places in the last decade and still a viable option for consideration.

Then further out in the future, technologies like ceramic filaments and selective emitters and so-called photonic lattices.

The next slide. This is a picture just

illustrating some of those technologies. Here Sandia Labs has taken tungsten adams and laid them down in a matrix which is so small that visible photons can escape through these openings, but infrared photons cannot. So, they would be trapped inside until they achieve an energy level that allows them to leave. By its definition, that is a selective emitter, it lets out visible light, but not infrared.

These are a couple of other manufacturers, Ripple Effect International and Sun Sight are both receiving funding in one sort or another to improve technology of incandescent filaments right now.

The next slide. These are the assumptions that I shared at the meeting in January. They remain unchanged. Krypton prices were quoted to us in volume by suppliers at 35 to 65 cents a liter. We measured by literally opening up incandescent lamps and filling them with water and finding out how much volume they held.

We measured the volume of various incandescent lamps, and standard fill ratios are 90 percent krypton, 10 percent nitrogen at 0.8

atmospheres. That yields 75 to 108 cubic centimeters of krypton. You can multiply that by the price per liter when you convert this to cubic centimeters, and you get an incremental cost of replacing argon with krypton in a typical incandescent lamp of 2.6 to 7 cents. That is the manufacturer's cost.

We assume that the final customer would see a price about three times as high as the manufacturer would by the time the mark up occurs between the manufacturer and the retailer and between the retailer and the consumer. So, we estimated a range of incremental retail costs of 7.8 to 21 cents.

Next slide. I think I showed you these data before as well. It just shows who makes most of the krypton and xenon in the world, so one of the reasons we talked to Air Liquid to get a price is that they are the largest single supplier world wide. Then here it shows where krypton is used. About 60 percent of the world's krypton's supply is already used in lamps today, although, I think more commonly florescent than incandescent. The next biggest market is insulated glass.

The next slide. I think Steve actually

forwarded me this. Steve, I am assuming this is current, something you found --

MR. NADEL: I got it off the website.

MR. CALWELL: Okay. This was an example of how one of the manufacturers is already marketing the benefits of krypton to its customers. This is OSRAM Sylvania product called the OSRAM Superlux Krypton. My apologies, OSRAM product and what you see here are the five different shapes in which it is offered. I know you can't read the text up here, but it says, thanks to the krypton filling, they provide up to 10 percent more light, and there is also another reference here to sort of improved optical qualities and other sort of non-energy benefits.

Down here it says, provides considerably more light than an ordinary light bulb from the same wattage.

Next slide. The sources for our krypton savings estimates were three different sources. This gentleman here, W.E. I think it is pronounced Thauret, he is now over 90 years old and living in retirement. I spoke to his wife, and he and some of the other researchers helped to confirm some of the original findings from the 70's. The first

paper shows here -- I am sorry, this is the first paper in 1970, here is the second one in 1975 showing that they got identical light output out of a 35 watt krypton lamp replacing a 40, 54 or 55 watt lamp replacing a 60, a 90 to 92 watt replacing 100, and a 135 to 138 replacing a 150.

The IESNA Handbook, which is a standard reference many of us have on our shelves at work in the lighting business, they summarize the findings of these two researchers in their 2000 report by saying, krypton, although expensive, is used some lamps where the increase in costs is justified by the increased efficacy or life.

Krypton gas has lower heat conductivity than argon. Also the krypton molecule is larger than that of argon, and therefore, further retards the evaporation of the filament. Depending on the filament form both sides, a mixture of nitrogen and argon and krypton fill can increase efficacy by 7 to 20 percent.

There is a separate OSRAM Sylvania reference that I have on my table there from an engineering bulletin in 1996, again, confirming the efficacy improvement of up to 10 percent.

The next slide. Estimating the savings

per lamp, I began to do a more complicated calculation. I realized that for purposes of estimating it, it is actually quite simple. The calculation ends up multiplying by 1,000 hour lifetime of a typical bulb, but then it ends up dividing by 1,000 hours to convert watt hours to kilowatt hours. So, the savings estimate becomes surprisingly simple, how many watts do you think it will save, and what is the price of electricity. You multiply those two together, and you get the savings in cents per bulb.

IEA estimates the most current residential rates in California at 11 1/2 cents per kilowatt hour. The five watt savings that the researchers found from a krypton lamp times 11 1/2 cents gives you 57 1/2 cents for a 60-watt lamp, more like 45 cents for a 40-watt lamp, and the calculation is a little trickier for a 100-watt lamp because they tend not to last 1,000 hours, it is more like 750. Here we've got a savings of 60 cents.

Why am I showing you all that math, because these savings give you the ceiling. You can't afford to spend more than that to make the bulb more efficient. If you can save -- if it

costs you less than that to save that much energy, it is cost effective by the definition of the Commission.

Next slide. Here I have made some estimates just to show you how I think this might work in the marketplace. The reason it says estimated up here is that it really is just estimated. I don't want to get into proprietary discussions with all of you about what your profit margins are, but I want to just show you if I can walk into a store -- let's look at these three columns here first, base low, base mid, base high. If I can walk into a store and buy on sale an incandescent bulb and a four-pack for about 15, 16, 17 cents each, that is probably the bottom end of what I am likely to see for awhile.

I think a more common price is about 25 cents each, and sometimes you see them for 33 cents or more a piece. Here we are talking about a very standard conventional soft white 60-watt lamp.

Then what I tried to do is extrapolate what are the elements of that cost. Remember before we had this assumption of a three-fold mark up, so whatever it costs the manufacturer, the

final price the customer would see would be three times that.

That is reflected here on an assumption that maybe that lamp costs 5 cents to make. The manufacturer doubled it and sold it in quantity to the retailer for 10 cents, the retailer put another 50 percent margin on top of that and sold it to the customer for 15 cents.

The actual divide between the manufacturer and the retailer's profit is not important. I think the more important number is just what the overall mark up between manufacturer cost and consumer. Here you see estimates 15, 25, and 33 cents final purchase price. Then I took the range of krypton costs that I showed you before and put them in there to see what that would do.

Here you see the krypton adder in red on top of the manufacturer's cost, the same percentage mark up to the retailer, same percentage mark up to the consumer. Again, in the medium case and in the high case. What you see is the incremental cost of the final lamp at retail going up by 7.8 to 21 cents.

The other interesting thing I could have

marked on here but didn't is the manufacturer and the retailer's profits in both cases are higher with the inclusion of krypton than they were without it. Yes, the customer's total cost of ownership has gone down because of the savings on operating costs are larger than the increase in purchase price.

Next slide. This is a chart that I showed you before back in January. I won't dwell on the details, but IESNA equations from the handbook and the results of the researchers from Duratest that I mentioned before allow you to construct a cost in dollars per million lumen hours for various formulations of an incandescent bulb with argon fill and that same incandescent bulb with krypton fill.

Here we were just showing different combinations of light output, power consumption, total cost of ownership, efficacy, lifetime, etc. and how they vary as you optimize the filament for different points.

For your purposes, the easiest thing to think about is here is the standard 60 watt bulb sold today. If you simply added krypton to it, you would drop down to here, and the cost per

million lumen hours would drop roughly by a dollar.

Various other formulations are possible that might reduce total cost of ownership further, but the do so by shortening life to the point where many consumers would not be satisfied.

Next slide. We were asked early on in the discussions of industry whether the claims made on the packaging were in some cases not correct. PG & E at its own expense obtained samples of, Ted, 30 or 40 different models? It has been a couple of years now since this was done.

MR. POPE: I think it was a little more than that, but I don't recall.

MR. CALWELL: Yeah, I believe it was 40 plus different models, multiple samples of each, and they all went to the Lighting Research Center for testing under controlled reference laboratory conditions. Here you see the nominal wattages as the red bars, and then the measured average wattages as the tan bars with a range above each one showing what variation was seen by sample.

Yeah, in some cases there was a bit of

variation by sample, but the measured value is tracked remarkably well with the nominal values.

Next slide. This is the same set of data now showing you light output versus claimed. It is important to realize we are talking about initial lumens here. This may come up later, but initial lumens appears on the package, initial lumens is what was measured at the Lighting Research Center.

Again, in some cases a fairly wide variation from sample to sample, but the bulbs don't consistently show themselves to be either slightly less dim or slightly brighter than claimed.

Next slide. I wanted to, you know, get the discussion going for later in the day by just flagging some questions and comments that came up to me knowing that there will be others for you.

One question arose whether low voltage lamps should be included. When we went back and revisited the manufacturer's catalogs, there were a whole series of 12 volt lamps and other lamps like that which fit other aspects of a definition of a general service incandescent, but if the CEC were to say this only applies to lamps intended

for operation between 110 and 130 volts, those lamps would be excluded.

The charts that I just showed you did not have those lamps in them, but when you put them in, they observe basically the same relationship and pattern we saw before.

Secondly, I went back to the FTC requirements in 16CFR Part 305, and they do say that lumens and watts should be reported at 120 volts even for lamps that are labeled as 130. You are allowed to claim the 130 values as well, but for certification and labeling purposes, you need to use the 120's. I recommend to the CEC to do the same for consistency with current federal labeling.

Do we need to in any way enhance the definition of enhanced spectrum lamps. You all have seen the definition the CEC is using now, and it could be perhaps improved or tightened.

On the test procedure issues, I showed you before some variation from sample to sample. So, the FTC proposes using something called Military Standard 105 for deciding how you sample products off the line to determine if a typical sample complies or if you need to have a larger

sample size in order to take care of standard deviation. That is one possibility for consideration if we get into sampling issues with the test procedure.

How many lamps should be tested? That is again addressed by the military standard.

Light output in initial lumens? The FTC proposes uses IES LM20, and I think, am I right Gary or Bill, did the same reference appear in the CEC language for IES LM20? Anyway, it is something we could look at is whether the standard needs to be clear about what test procedure is used for light output. It is essentially intended to be identical to what already appears on the package of the products.

The same for lamp life, there is IES LM49 specification. I didn't, interestingly enough in the FTC write up, I did not see a referenced IES procedure for wattage. So, I don't know if it is captured within LM20 or if the industry could recommend another IES standard test procedure for wattage.

Two other items, technology neutrality. Some folks have raised the issue that over the life of this proposed standard, LED products may

start to arrive in the market in some quantity. Should the spec be written in a technology neutral way that would allow them to play, and then finally are there other definition questions that I haven't raised.

I think that is the slide. That's it. I hope that is helpful, and I am happy to take any questions, or we can just open it up.

MR TUTT: I guess if anybody had any questions about either the staff presentation or Chris' presentation, it would be a time to do so, but I would propose that since most of what we are talking about, particularly in Chris' presentation, is the general service incandescent lamp structure that we just start off talking about that standard, and if any questions arise as part of that discussion, Chris and staff are here available to answer them.

I throw it open to anybody who wanted to make any comments about the proposed standards on general service incandescent lamps and get a discussion going about how those standards are going to work for us all.

PRESIDING MEMBER PFANNENSTIEL: May I request that when people make comments, that for

the record you identify yourself so it is in the transcript. Thank you.

MR. TUTT: Dale.

MR. WORK: I can start. I am Dale Work from Philips Lighting, but my comments this morning are really on behalf of the NEMA lamp section who has discussed this.

I want to offer several points later that we ask for people to keep in mind when making these regulations. I want to start by commenting on the Tier 1 and Tier 2 approaches.

Tim said in his introduction, and it was also said by Chris, that the original straight line was not something that we supported. The reason for that is that we don't think that straight line makes a distinction between energy efficiency and energy savings. You made that point very clearly. We completely agree with that.

We think that the revised approach shown here is much better. We think that it does not go nearly far enough, and we would welcome working with you even along this same line of thinking to show how we think that we can give the customers more choice and save as much or more energy by

following this same line of reasoning.

Now this should not be construed that we endorse the original krypton report. We have submitted written comments. We think that was a seriously flawed report, and we don't think standard based would be economically justified. We stand by that. While we would likely continue to disagree on that report, perhaps we can agree that an academic exercise is no substitute for being in the highly competitive market place trying to give customers value for their money.

Our point today is not to criticize that early report or even to dwell on it. I volunteered with Chris to talk with him off-line to do some of this. It is to volunteer our companies to help the CEC finalize your proposals that avoid such pitfalls and that save energy in a cost effective way and that still give customers the kind of choices they want.

That is my set of umbrella comments. I would like to offer nine points that we thing reflect California's serious intention to save energy, and that also reflect our experience in the marketplace with consumer preferences and behavior.

They don't flow, so just nine discreet points. First of all, industry experience is that in general people do not read lamp packaging except for wattage.

Second as a broad statement, customers prefer today's standard wattage lamps to reduced wattage lamps. That is why they are offered. This is so despite efforts by many manufacturers to get customers to trade up to reduced wattage offerings. Not only in the past, but also at the present time.

Third if standard wattage lamps are allowed on the shelf at the same time as reduced wattage lamps, we believe that very little energy savings will result, even if the reduced wattage products are more efficient. More simply to save energy without arduous long term market transformation efforts with limited prospect of success, standard wattage lamps should not be on the shelf as purchase options in competition with reduced wattage options.

Fourth, manufacturers want sufficient room in any regulation to differentiate themselves and their products from their competitors. Regulating a specific life lumen and wattage item

makes differentiation hard to realize. We believe that customers want more choice than this.

Fifth, there is ample market evidence that for a given wattage lamp, substantial customer variation exists in their lumens lifetime trade off. To this point, lower wattage long life lamps can save just as much energy as low wattage standard life lamps or as low wattage short life lamps. The key is low wattage.

A sixth point, and this has already reflected and California is aware of it, but I want you to know the industry concurs, in general, as a person ages, she will both want and need more light for tasks. Any new regulation should consider this, especially with aging population. This does not mean that energy can't be saved, but it means that any decrease in light level must be carefully considered lest customers trade up to the next wattage.

Seventh point, customers see general service incandescent lamps and the economical functions they provide as a basic necessity. Such lamps are not viewed as high tech devices, despite an incredible amount of technology imbedded in them.

The eighth point is that NEMA Companies are willing to propose a regulatory approach that can save energy while still allowing a broad range of product possibilities, many of which we believe customers will accept economically.

My final point is that NEMA Companies are willing to work with the CEC to develop technological and historical background information pertinent to these standards. This can yield more fit for use documents. Specifically NEMA Companies are willing to review with the CEC technological options for increasing incandescent lamp efficiency. Openly discussing the trade offs involved, and there are always trade offs.

Thank you for allowing me the opportunity to present these remarks.

PRESIDING MEMBER PFANNENSTIEL: Thank you. One question on your remarks. It actually focuses a lot on the last point, but I think it carries for the eight above that. NEMA has been working with the Energy Commission, certainly over the last six months, but I believe prior to that as well, and yet we don't seem to have reached resolution in a place where you can support where

we've come up. I guess the point of being willing to work with the Energy Commission on technology advances, it seems like we are doing that now, but we haven't yet reached a point where NEMA is satisfied with the outcomes, is that a correct characterization?

MR. WORK: I think that is pretty fair. I think that we could even suggest and develop and even work with you to develop an outcome much along the same approach as this revision which we think is a good step in the right direction. We think that approach could be taken even further to give the customers a lot of choice and absolutely save energy.

PRESIDING MEMBER PFANNENSTIEL: Now is that proposal ready for us to look at now, or is that something that would require a longer period of time to consider? Where would a proposal like that be?

MR. WORK: We are not ready to present that today because we have not discussed it among ourselves sufficiently. I don't think we are talking about a six month interim before it is ready. I would let other NEMA Lamp Section comment on that if they wish.

MS. HORNER: I agree. This is Pam Horner with OSRAM Sylvania. As we are sitting here today, one of our lamp development engineers is working on such a proposal to see if all of the companies represented by NEMA could indeed with some slight variation on what has been proposed with work for us. While we are sitting here, they are working on that.

PRESIDING MEMBER PFANNENSTIEL: What I guess I am really questioning is and we have delayed for six months so far, and as we have been working together to try reach resolution. I think that there is a real concern on my part at least about how much more delay and where will we be if we waited another month or two months or three months, and so I am trying to get some calibration about how much longer we are looking at.

MR. HOWLEY: This is Joe Howley from G.E. It is true we've been working for the past six months, but I would characterize our work in the last six months as being a discussion of the issues raised in November, why we put it off to begin with, and we had a thorough discussion of all those.

Also, there was a lot of discussion

around the concept of having a marketing test with certain technologies that we were initially aiming for this fall that for a variety of reasons we weren't able to achieve consistently across all companies.

We weren't specifically working on a reg, in fact, we still had a lot of debate on whether an ultimate reg was needed or not. The fact that a reg has now been proposed and CEC clearly wants to go in this direction, I think leads us to a different point in the discussion. The point in the discussion up until now has been does this make sense. There are a lot of marketing questions. Do we need to answer those marketing questions before we move forward with the regulation. That is generally what we were discussing, in fact, even moving ahead with the test versus a reg.

If the CEC now wants to shift gears just to talk about the reg which obviously is happened, the proposal has been made for a new reg, this is a new starting point for the discussion in a sense, although what has been proposed has taken into account several of our concerns, so in a sense, we have both moved closer to one another.

Since this has only been out for a week, I can say for my company, we certainly haven't had enough time to analyze it. This time of year a lot of people are unavailable for a week or two due to vacation schedules. We would need certainly some more time to consider this new proposal and what the potential is for it and also with other NEMA companies to determine potential. So, we are not in a position today to do this simply because it has only been proposed what about a week ago or a week and a half ago, something like that.

PRESIDING MEMBER PFANNENSTIEL: I just want to follow up on and I do think I agree with you, Joe, that there really are two paths that we have been going down. There is the one of the technical reg and the other of the marketing, which I think we need both. I think they need to be compliments to each other. I haven't felt that we've been doing one at the expense of the other. I feel that we have been pursuing both, and we have here the discussion of a proposed reg, and we really don't have on the table the discussion of the marketing accompanying it.

I don't want to lose that. I think that whether we need to talk about it now, I'd like to

really spend more time on technical issues, but I don't want to lose sight of the question, and it was certainly in the first several many points of Dale's points to consider is how do you get the customers to understand and to accept and to buy in to what any technical reg might look like.

I think we want to do both, but let's work for awhile on the technical question of the reg.

COMMISSIONER ROSENFELD: I have a question for Dale. I'm very encouraged by your statement that you like the staircase. Actually the staircase is a great idea. Who gets credit for the staircase, Chris?

MR. CALWELL: Tim.

COMMISSIONER ROSENFELD: Tim? Wonderful. That's good. I'm certainly encouraged by your statement, by your interest in saying maybe in fact we don't want 60 watt lights competing with 57 1/2 or whatever. I am trying to understand and see if I really get it.

I think the extra point you've introduced is that there is also a trade off between lifetime. That is an nice amenity and efficiency. So maybe what you have in mind is

that this staircase is only the projection for say 1,000 hour or a 750 hours, and you want another turn in the equation or another dimension on the plot which has service life.

MR. WORK: I don't know that it requires another dimension, and certainly that is the kind of thinking we've had, but I would underscore again NEMA doesn't have --

COMMISSIONER ROSENFELD: You haven't figured it out yet.

MR. WORK: -- an agreed upon approach yet, but that is exactly the kind of thinking that we are going through.

MR. TUTT: I think I want to agree with Joe that I really think this proposed structure hasn't been out there very long, so I can understanding taking a little time to understand what it is and work with it, and I am really encouraged as well that you are willing to work with us on it. This is just a proposal at a workshop right now. We haven't even taken the step yet of filing for a regulatory proceeding to start.

We do want to get this right at the beginning if we can, and I am encouraged that we

can work together on that. Also echo Commissioner Pfannenstiel's concept or point to that we are not hopefully dropping the second leg of this, the marketing leg, in our discussions throughout the spring of this year, we were very encouraged and serious about going forward with a marketing test this fall. As Joe mentioned, for various reasons, that just didn't seem like it was going work, and it was postponed for a year.

Within the concept of having these technologies being developed and put out there and being able to market them in collaboration with the utilities and the retailers and all of the stakeholders at Flex Your Power is in contact with, I think it is a very exciting prospect that we can move forward on that too. It is just that it happened to be postponed for a year, and our attention turned to figuring out how we can do this as part of that.

MR. HOWLEY: Thanks, Tim, this is Joe Howley again. I would agree that I characterize the six months as perhaps in CEC's position, they were working on both (indiscernible), from the manufacturer's position, we were quite clearly focusing entirely on marketing and marketing

tests. We were not focusing on trying to fix the current proposal or even trying to come up with a new proposal that might work.

For us, this is a change in direction focusing now on a proposal that we feel has more merit certainly than what was proposed initially, and we are basically what your hangers -- we are not saying we are going to discount it immediately, which is somewhat what we did with the Tier 2 initial line where we just said, well, this just won't work.

Now we have something where we do want to analyze it much more thoroughly to see it looks like it has more promise to it, and there may be some avenues here that we can get to a mutually agreeable position on. So, we will see how that goes.

MR. NADEL: This sounds promising both in terms of the proposal and willingness to consider and the general concept to come up with something alternative. I am a little confused with the dancing around about timing. If I understand the CEC was typically hoping to begin the more formal rule making process that you guys can say by typically in the fall, are you guys

saying you need two weeks, four weeks, six weeks, can you give a sense? I'd be curious, and I suspect the Commissioners would be curious about how much time do you need to present something concrete?

MR. HOWLEY: I don't think we can give you -- I mean it is literally so new. We could give you a sense after we get done analyzing it more thoroughly, but certainly by the fall, you know, the next month or two we will be looking at this, and in the next couple of weeks we will be looking at this. It is very new, so it is even hard to project what time we would say this would be available in. If Dale has a different --

MR. WORK: No, I would underscore that. I would say -- now I am putting on my Philips hat at the moment instead of my NEMA, even within Philips, if we wanted a specific proposal, this will take a month or two within Philips. Okay? There is competing product lines who have an interest in this, etc. I am thinking that once Philips knows what we want to do, then we go to NEMA and we look for an industry consensus. That will also not occur in one afternoon. We are not looking at something here that is two or three

weeks. I think we are looking at something here that would be a few months I would say.

MR. CALWELL: Dale, this is Chris from ECOS, Chris Calwell. You had mentioned the notion of going further with this idea, and I just wondered what does that mean? Is that art's notion adding another dimension, are you saying extend the lines out further so it is virtually impossible for a 60 or a 40 to comply. I just didn't know what you meant by going further.

MR. WORK: I have to be fair here because not all of the NEMA people have been present the last week. Joe has been on holiday, for example, and we've only seen this for a week. Our discussions have been along the line of where should the lines be because that initial line has some built in krypton assumptions that we don't accept.

Otherwise, aside from that target line, they had to do just as you said, Chris, with extending the lines.

COMMISSIONER ROSENFELD: I missed the word, with what the lines?

MR. WORK: Extending, for example. Yes, but again, that is not being fair to all the

companies who haven't seen it. In the NEMA discussions we had last week, that was at least the thought process.

MR. CALWELL: Yeah, maybe can we bring the chart back up? Is it easy enough to get to if you just go backward in that presentation? Yeah like that. You can see here -- let me get out of the way of the projector. Here is a case of a lamp that is still 100 watts and complies just barely. In general, most of them comply by going down on wattages as opposed to rightward on lumens.

It could be that with some minor extending either you change the "Y" intercept of this line or you slide the plateaus back to the left or rightward a little bit could essentially be -- it would be so much easier to reduce wattage than increase light output that I don't think the Commission can essentially right a standard that says "Thou shalt not sell a 60 watt lamp." It could be functionally equivalent to that by the nature of the spec line.

COMMISSIONER ROSENFELD: This is a crazy example, and really I am thinking of a third dimension where you put in service light, but you

could of course tilt the staircase instead of having it horizontal. You could have it more than horizontal, worse than horizontal, and, of course, that would do just what you said. Don't take it seriously.

MR. CALWELL: Yeah, I tell you the hardest part about this spec versus a straight line is trying to calculate what the average energy savings will be because some of the lamps over to the line is a gigantic distance and a lot of savings. Others are very very close. In fact, you can see here that I think the example was in your presentation, Tim, where you were showing what was it, you could be at 57 1/2 watts or less and comply with a 60. So, that is not a 10 percent reduction, that is more like a 5 or 6 percent reduction. It could be like I said the "Y" intercept of this whole line, is the line at the right height, or does it need to come down slightly or up slightly. That is I think in play as well. Hopefully that helps just by seeing an example. Maybe can we go to the clear and frosted one as well, which is just right there.

Right there, yeah. Sort of the same idea. Now here you notice that some of the

plateaus are wider than they were before. Here again, we found one sample that met it by becoming brighter, but the vast majority of them would meet it by becoming lower wattage at the equivalent brightness.

MR. TUTT: I guess I would say I know that you guys have just seen this, and I think it would be great to somehow try to help you all participate in that deliberation back and forth about whether the line is in the right place, whether other dimensions need to be added and so on. I am encourage, again, by working together on trying to get this in the right place. We want energy savings first and foremost, and we want consumers to have the value and ease that they are use to in their lighting purchases as well.

MR. FLAMM: I have a question, this is Gary Flamm. In addition to the slope of the line, does NEMA see the implementation, proposed implementation dates as being pushed back also?

MR. WORK: We haven't discussed that.

MR. HOWLEY: Each of us would have to go back internally in our companies and see what it would take. In this kind of proposal, you are talking about brand new products that probably

have to be generated, and we have to go through a whole process to see what, when, where, and how big the scope is as well. We initially were talking about the marketing, a smaller subset, the high volumes types.

This, at least initially, would propose or encompass a higher volume of products, and therefore, require more work in producing potentially new products or may come back and say certain products we feel really shouldn't be covered in this standard. That is also something we have to analyze internally within our company to see what products when, where, how, and how much time we would need. So, it is premature to say whether that date, I guess at that point, may or may not be acceptable. We need to do more analysis on it.

PRESIDING MEMBER PFANNENSTIEL: Other comments, questions, thoughts on proposal that is out there?

MR. HOWLEY: Just one last thought. This more goes to the marketing side of it, but if we are going to introduce new products into the market place, some how we have to do this in a way that doesn't totally confuse the California

consumer, and I am not sure how we are going to do that yet. Maybe it is a transitional period where you do have both products on the market for a time so they get used to it, but then there is a date in the future where perhaps once they get used to having both products there and one of the products may eventually go away which is the way traditional energy efficiency regs work. Both products are available and then perhaps the higher wattage or less efficient product goes away at some point once the consumer is used to having both products there. It may be very confusing to have one product there one day and have a whole different set of wattages there the next day. Hence our concerns about what would the consumer do under that scenario. What would he pick? Would he indeed pick choices that would lower wattage, and does he understand what he is doing at that point or she is doing in terms of choices, or would we produce mass confusion in random bulb selection?

PRESIDING MEMBER PFANNENSTIEL: John?

MR. WILSON: Two thoughts. I am John Wilson. The staff at Flex Your Power couldn't be here today because as the temperature rises, their

activity rises for their conservation program --

COMMISSIONER ROSENFELD: Are you their spokesman?

MR. WILSON: Yeah, I'm authorized to say that they are quite interested in doing a statewide marketing program next year. This is what we talked about two months ago the last time we got together in our small group was not doing the regionally focused market test this year, but that didn't forestall going ahead with a statewide program next year. So, they wanted everybody to know that they are still geared up to put a significant effort into this.

The other comment was we all need more time to think about this proposal and get feedback from the industry. Maybe one way to deal with the concern about not letting this disappear again into a six month black hole is before the end of the day schedule another public workshop and get our calendars out and figure out when that would be, say, I don't know September, when we could ge together. First of all, get it into our calendar which is useful, but also it gives us something to work toward.

PRESIDING MEMBER PFANNENSTIEL: I think

that is a very good idea to give ourselves a date that is a commitment to all of us, to put in whatever time and effort is necessary to reach a next workshop where there will be presumably a NEMA proposal on the table and presumably one that we've all contributed to.

MR. WORK: I'm coming to it from an industrial perspective, and it is a question to the CEC. If due to any new regulation we need to invest capital equipment to do something different, normally when we invest capital equipment, we invest it thinking that we will use it for the foreseeable future, but if, in fact, the CEC intends to have a new regulation every two years, that gives us a very different perspective on buying equipment to do something. Maybe you can give us some idea as to how permanent you think regulations would be. Do you see my point?

PRESIDING MEMBER PFANNENSTIEL: I do absolutely --

COMMISSIONER ROSENFELD: Are you scared that we would somehow or another lose our enthusiasm and undo?

MR. WORK: No, that wasn't -- yes, it might be the thing that we invest in this year to

meet the standard that has no use in two years, so we have to recover all of that in two years.

MR. WILSON: Is he afraid we will get more enthusiastic?

PRESIDING MEMBER PFANNENSTIEL: I guess that argues that we go as far as we possibly can this time.

MR. WORK: Or let us know --

PRESIDING MEMBER PFANNENSTIEL: Yes, right. I understand. We clearly don't have an intention of doing that, so what we need to do is think about in whatever we would adopt some safeguards, perhaps, that would help you on your investment decisions.

MR. EILERT: My name is Pat Eilert, I work for PG & E. I spoke to the residential mass market manager this morning for our programs, and she still views this as a pretty good opportunity for rebate programs in the future, upstream types of programs. That is still on the table. There is no final decision made or anything because we don't know when things are going to happen and so forth, but there is still a good possibility of that too.

COMMISSIONER ROSENFELD: That does mean

that taking Joe's point into mind, the ramp up could involve incentive programs earlier than the standards coming into effect?

MR. EILERT: Yes, that's right.

MR. NADEL: You get the consumers familiar with the projects.

COMMISSIONER ROSENFELD: Right, with PG & E advertising budgets.

MR. EILERT: To be able to do this, though, we kind of need to know time frames fairly soon.

MR. PENNINGTON: This is Bill Pennington. I would just like to note that this is probably the first time I've heard a utility say something positive that is definitive about incentives programs. There is quite a bit of discussion among the utilities about there ought to be those kinds of programs, but I haven't heard a utility say there is something definite in their planning, so that is quite a movement I think.

MR. EILERT: Let me just clarify. There is no definite decision, but we still view this positively, and we are still looking for information.

COMMISSIONER ROSENFELD: Sounds good.

MS. HORNER: This is Pam Horner with OSRAM Sylvania. I would like to also put in all of our minds I think at this point the importance of eventually bringing on board the retailer's point of view, especially as regards the messaging, the marketing, all of this.

So far, unless each of our individual manufacturers have engaged them, they really haven't been part of this public discussion, and they are critical to messaging because I know that we who do this everyday don't always understand the limitations that these retailers have. We assume they can put an end cap that does "X" or "Y" and then all of the sudden, what do you mean, we can't do that.

So, I think it is an important thing to put in our notes to include that point of view.

PRESIDING MEMBER PFANNENSTIEL: I think that is a really good point, and I think we need to find a way of bringing the retailers into our discussions.

MR. FLAMM: This is Gary Flamm. Do you have specific contacts that you would recommend?

MS. HORNER: Each of us would have.

MR. TUTT: I think Flex Your Power,

Wally McGuire, also has those kinds of contacts, and we have been talking perhaps through him, this is Tim Tutt by the way, about getting the retailers on board the marketing campaign. Maybe, Pam, what you are talking about is also getting him a little bit on board with a standards discussion and seeing how that works.

MS. HORNER: I'm implying, yes.

MR. TUTT: Any other comments or questions on the general service incandescent lamp proposal that we have?

COMMISSIONER ROSENFELD: Except to say this was a jolly good discussion.

MR. TUTT: It was a jolly good discussion, and I want to again take John up on his idea to try to schedule another public workshop in September to discuss this. Also, we have had these collaborative meetings through the spring, and we probably needed a couple of those in between now and that workshop, so afterwards, we will try and get calendars together so we can have those kinds of meetings to discuss the issues in more detail before a revised proposal comes out in September.

MR. CALWELL: Is the intent that it

would be covering all the lamp issues or just general service for September?

MR. TUTT: It will cover all the lamp issues certainly. We haven't talked about the other two, but we are going to get to those next I think unless there is --

PRESIDING MEMBER PFANNENSTIEL: Maybe we can resolve those, Chris --

MR. TUTT: Yeah, maybe.

MR. CALWELL: All right, okay. Yes, my fiancee reminds me there is a window of time in September when I am not available due to a wedding, but except for that, I would be delighted to join the --

PRESIDING MEMBER PFANNENSTIEL: We would be great guests.

(Laughter.)

MR. CALWELL: It is in Telluride, so the scenery would change a little.

MR. TUTT: Good place for a meeting. Why don't we move on to the proposed standards for state regulated incandescent reflector lamps. Gary, do you want to bring that up on the screen so we can have that. Again, we have had discussions with the industry about these. We've

made a few changes to our proposed standards from last fall as I mentioned earlier.

We've delayed the date that the standards would be affected by one year, changed the category to the lowest wattage, from 40 to 41 watts effectively exempting 40 watt and lower bulbs and propose a specific exemption for 50ER30 lamps. With that just sort of general proposed structure, again, I want to ask if anybody has any comments or questions on reflector lamp standards that are proposed here.

I know that in our meetings there was a serious question about what consumer response would be here as well as these reflector lamps are made slightly more expensive by standards perhaps. What would consumers do in some cases, would they put in general incandescent lamps in the reflectors, or would they do put in higher wattage, halogen versus lower wattage, and trying to understand that consumer behavior to the extent we can without actually being out there observing it, but also understand how these standards might work in that context.

I would note that in our previous analysis of the energy savings from the proposed

reflector lamp standards last fall that reflector lamps in the analysis that was done and were used in both residential and commercial applications.

The commercial applications don't have as much of the market by volume, but in terms of the time and number of hours the lights are on, they correspond more with California's peak issue which we are facing this week to some degree.

As a result, based on the calculations last fall, about two-thirds of the MW savings that we anticipated from the reflector lamp standards came from the commercial sector not the residential sector.

With that in context in terms of consumer behavior, I'd also like to ask the industry whether they have any thoughts about commercial customer behavior with reflector lamps as opposed to residential customer behavior.

MS. HORNER: This is Pam Horner with OSRAM Sylvania.

MR. TUTT: Are you going to talk about your kitchen, Pam?

MS. HORNER: Yeah. In my company, I am known as the "Black Angel", I bring bad news sometimes. I hope I am not fitting that

description today.

I have prepared some remarks that reflect upon not only my own company's view, but NEMA's point of view as well.

What I would like to address today goes way back to the beginning which is the document that underpins the proposal. That document is part of the codes and standards enhancement or case initiative entitled "Analysis of Standards Options for BR, ER, and R20 Incandescent Lamps" that was prepared for PG & E by ACEEE on April 28, 2004.

It was from this document and based upon this document that the energy savings and installed based savings were calculated and put forward. Our general reviews shows that virtually none of the BR, ER, and R20 lamps that are manufactured today would meet these proposed standards, which implies that manufacturers have two choices to meet the market demand should these types of lamps essentially be regulated away.

One would be to try to redesign our BR, ER, and R20 lamps to meet the requirements. In that scenario, this would not change the wattages available, nor would it save any energy.

Secondly, stop selling them in California and promote the use of alternative lamps. Those are the two big views of how we would take a look at this.

We would have a number of approaches we could take today. I could focus on woe is me, oh poor manufacturer, bring out the violin. We are not going to do that.

We could focus on what is now the well-known NEMA position that states are federally preempted from regulating these. We are not going to do that either.

MR. TUTT: So far so good.

(Laughter.)

MS. HORNER: Maybe I am the white angel. What we would like to do is take just a very strict look at the numbers, and we would like to examine what I am calling the alternate lamps assumptions which are within this document and test the hypothesis that California may not save energy if these products are regulated as you propose.

I have three buckets of comments. The first I would like to just very briefly review for all of you in the room a few of what I am calling

the case document, which would have been Steve's document, what these assumptions were.

I'd like to begin with a statement that they make and we agree it, which is that the energy savings of such a standard depends on what lamps consumers buy after the new standard takes effect.

What did this document assume? Of the more than 2.5 million BR lamps sold annually in California, and by the way that is one-third of all reflector lamp sales according to the document, the 65 BR30 is the most popular, particularly in the residential sector. In a moment, I am going to grab that one because to do every single one, I would be here forever, and we don't want that.

The second assumption that is important for today's discussion is that the installed base of these 65 BR30's, which I am going to be using as my example, is if we go through the numbers, it is about a third of the BR types. Just for numbers today, I am going to call that about 10 million. I use Steve's numbers to back into this, which is the largest single type among incandescent reflector lamps that are in use in

the state.

Third, when faced with replacement decisions for this 65 BR30 "Some will be replaced 50 watt halogen, some with 60 watt halogen, and some with higher efficacy 65 watt BR30" which means that the authors expect some 65 BR30's to continue to be sold.

The next point is that an average of 7.5 watts will be saved per 65 watt BR30 lamp if it goes away. Now this translates to an assumption that was made by the authors that 50 percent of the people would choose 50 watt halogen, the other 50 percent would choose higher efficacy 65 watt. The difference being 15 watts and you meet in the middle with the 7 1/2 watt savings. That is the assumption in this document.

Next to last, there will be no significant increase in the practice of consumers using A line lamps in these sockets. They have already cited a study that shows approximately 17 percent of people already do this practice, and they have indicated that there will be no significant increase in this practice.

Also, there are no consumers who will choose replacement lamps any higher than 65 watts.

Finally, there is an assumption stated that the 50 watt ER30 which you note has been a new exemption or proposed exemption, is a viable low cost alternative to halogen replacement lamps and "can be produced cheaply and in quantity". Those were the assumptions that we took a look at.

I would like to make five points that challenge these assumptions. The first is that there is no rationale given for the consumer choosing only a 50 or 65. What consumer data do we have, any of us, that would show this is the outcome? I think this is a question that certainly must be answered.

If wattage reduction is the goal, which has been the conversation up until now at this meeting, why is it assumed that some version of the 65 watt lamp will still be available and contribute to energy savings. I think that is another point that needs to be thoroughly analyzed. If these were so available, why would the consumer not continue to just choose those?

The second set of challenging comments are these. The only reason given for assuming that A line lamps won't be chosen as replacements more often than they are now is that the authors

"think this practice will not significantly increase since there will be low cost, high efficacy, 65 watt BR30 lamps still in the marketplace" and according to and I cannot speak or NEMA on this one, according to our lamp scientists, the wide availability of these lamps is not likely.

Third, assuming the 65 BR30, which I am using as my example here goes away, consumers would have as we see it, five basic choices to fill that medium based socket. As many of you in the room know, the place where these largely live are in the recessed down lights in the home, it might be in the kitchen, the living room, this sort of thing, or in the hospitality sector. It would be home-like atmospheres, which are in residential looking rooms and hospitals, baths, hotels, that sort of thing.

Assuming this, there would be five basic types of choices when you are standing there with your burned out lamp that you can no longer replace. What do I do? A) the screw-based compact florescent bulb is a viable alternative, both reflector and non-reflector styles, but they do cost more, and most models cannot be dimmed.

B) there is the halogen reflector bulb. As the report states, they do cost more, and they are still available in full wattage versions, some in what we call long neck, which in Texas used to be a beer. In the lamp business, it means it simply has a longer neck to replace these BR type lamps and have a fit that works. Others in short neck styles that don't necessarily fit in these down lines.

C) there are the standard household A line lamps which cost far less and are widely available.

D) There are halogen versions of those which cost more.

E) There is this 50 watt ER30 bulb that is one inch longer and three quarters of the efficacy of the existing 65 BR30.

The fourth challenge would be this. Faced with choosing a replacement for this lamp, one of the likely places -- you know, what is a consumer to do? Where do you look, what do you do, what do you know what to do?

One of the places that they will likely look for guidance is up. That would mean at the ceiling into the fixture, into the maximum wattage

sticker that resides within that fixture.

I've done some analysis here and taken a look at other NEMA luminaire companies to find this out. The typical five inch diameter down light that you would find in California kitchens is marked at a maximum of 75 watts, and the six inch is marked at 100 watts.

I would question why weren't these practical options, meaning 75 watt and 100 watt choices, including as factors in the savings calculation.

If you take the call it an engineering point of view, the true installed base for fixture from an engineers point of view is the maximum wattage on the fixture, not what lamp resides in that fixture because they have to size the wiring and all of that of course.

The final set of challenges to these assumptions particularly regarding 65 BR30's, and this is the kitchen story, since halogen par lamps have narrower beam distributions than BR lamps, the coverage in the room has changed with par lamps are installed.

I've told Tim and John this story, even as a lighting person for 30 years, I made the

change. I took out the 65's and put in the 50's, and I have no light on my counter, so I have to put in two more fixtures.

The point here is that consumers finding that chunks of their counters or tables may no longer be lighted have a very real likelihood of adding more lamps and lighting in order to fill in.

COMMISSIONER ROSENFELD: Pam, I'm sorry, just to repeat that. You took out what?

MS. HORNER: Here is the point I would like to make. A BR 65 has what we call a 60 degree beam spread, so it is 60 degree cone of light that gives even coverage on the spacing found in real jobs today, no matter if it is commercial or not. Restaurants also wanting even coverage use this lamp.

That is the designation for a flood. If you put in a halogen, the typical halogen flood designation is 40 degrees, so your light -- here I am doing this for the microphone, but the light becomes narrower. If you can capture that, it becomes brighter underneath, but your coverage is not as good. In order to reach over --

COMMISSIONER ROSENFELD: You can't buy a

60 degree cone halogen.

MS. HORNER: You can buy a 50 degree, but only in a long neck, so there are all these caveats that those of us who have been doing application work for a long time know, and there is this multiple frustration level of going to the store and saying what do you mean I have to have a long neck, I'm not even going to do this.

There are some 50's long neck only, there are mostly 40's, and then there are 25's. This is also another problem that occurs is that our famous 50 ER30, which is a flood, which looks like a viable alternative, its flood is 30 degrees, which is the same as a spot for a 65 Br30. We end up with a strong likelihood of bad coverage, and my husband can't do the crossroad puzzle.

Given these challenges, it is pretty easy, and I've managed to do it. I can do 100 of them, I did three, simple scenarios where relatively small changes in these case assumptions result in reduced projected savings for the State of California. In fact, you could get down to the point where they either disappear or you start using more.

Again, depending on what we assume. So, I asked the question, who is right? Are my scenarios right? Is the case study right? We don't know, nobody knows. This I think goes to Commissioner Pfannenstiel's one of our opening remarks about including the consumer in this equation.

As an example, in fact in Steve's paper, he didn't give himself quite enough credit on the projected MW savings, but if you just take the 65 BR30's using the 50/50 as I described and assuming the 10 mil estimated lamp base, if we changed them over today, you could end up with a 75 MW installed base reduction.

Just by having half the people pick the 75 instead of the 50, you are down to 12, and just by incorporating a few "A" lamps, you are down to one. So, it doesn't take much. It takes very small adjustments. So, I thought it was worth presenting this information so we could all examine it more closely. Again, this isn't criticism, it is the analysis of the underpinning.

In conclusion, I'm going to skip my federal government stuff and say that there is enough anecdotal evidence from industry indicating

that consumers who seek substitutes may choose a higher wattage and will likely choose based on price.

In the case of these reflector lamps, our belief is that the consumers will choose higher wattage options often enough that in the best case no energy will be saved, and in a worse case, more energy may be used.

I'd like to thank you for giving us the chance to express this and focus on a very specific part of proposed regulation.

PRESIDING MEMBER PFANNENSTIEL: Thank you. Steve, do you want to respond I would think to some of the challenges to your assumptions?

MR. NADEL: I'd be happy to, although these will be initial responses. I've just been frantically taking notes. I didn't even have a week to prepare. I've had minutes to prepare.

I appreciate the fact that Pam and NEMA have reviewed these assumptions. As she noted, they have been out there for about a year and a third. I'm always happy to get comments on them. It would have been nicer to have had them much earlier in the process instead of there have been umpteen iterations of this, and up to now, no one

has commented on these, even though they have all been out there.

Pam concentrates on the 65 watt category which is the most common category. It is also the category probably with the lowest energy savings. So, she is picking up in terms of savings per lamp, she is picking on the category that best makes her case, and, yes, it is the most common category, so I think it is important to look at this one.

For the other categories, I think these savings are greater because of how the federal regulations was set up when they extended. As part of the negotiations, they extended the federal category from 60 to 65 watt lamps, so we have this whole class of 65 watt lamps that can actually meet the standard without saving wattage in other words.

In terms of one key assumption she said is not many 65 BR lamps will continue to be sold. I would disagree. I suspect Joe Howley's marketers might disagree. GE does have products that meet these standards, the 65 BR. They use a silver reflector. It is not rocket science. I would assume that Sylvania and Philips and other people

could do it too rather than lose market shares. There are great potential to have 65 watt lamps and to all of the sudden have all these options and say, well, you have this difficult choice and this difficult choice. They are ignoring one of the more obvious choices.

She also ignored two other choices that we had in our analysis. I am not saying they will be -- well, one other choice, not a big energy saver, there is also the halogen IR lamps. Instead of being a 50 watt base, those would be even lower wattage. I don't expect large quantities of these, but there is another product with even greater savings out there.

I don't think there will be much A lamp sales. She says, well, maybe there would be. A lamps do not give very good light distribution in these fixtures. There is some use of that, but they give poor lighting quality, and when people have the chance, I think will generally be replacing them. I don't see this increasing at all.

It really comes down to so how many people use 65's because we think they will continue to be available. How many will go down

to the 60's or the 50's versus how many might go up to a higher wattage.

We do know that before the federal regulations took effect, there were virtually no halogen lamp sales in residential homes. Now according to the figures we have, we are up to 20 some odd percent of residential, so we show that regulations can significantly increase the sales.

If you look at the data behind some of the numbers here, you can see that the 50 watt lamp significantly out sell the 75 lamps. We think more people will go down based on this data to the 50 than the 75.

Can I defend an exact 50/50 assumption? No, these are educated guesses, but I think you would have to go to a fairly extreme set of assumptions in order to show that you don't have energy savings. This is the category with the least savings per product. The other categories you can make even more of a case.

MR. TUTT: Steve, can you just say what other categories you are talking about so we are all on the same page there?

MR. NADEL: You do have the 85 watt BR, and that the way the categories are drawn, you

cannot substitute a new 85 BR. I'm not aware of technology that will allow it to compete. In that case, generally, you are going to have to go down to a lower wattage, halogen, I think, will be the primary mechanism.

MR. TUTT: Are you talking about these categories up here on the --

MR. NADEL: Right. Often lamps are sold kind of towards the upper end of those categories, so a BR -- an 85 watt BR is a somewhat common product.

MS. HORNER: We don't make it.

MR. NADEL: What?

MS. HORNER: We don't make it.

MR. NADEL: Okay, you don't make it, some other companies do. That one we project and say the 7.5 watts average savings 12.5 watts for example. There is the 120 watt BR40 category. So, that is in the middle of the 116 to 155. I am talking about the common lamps. Again, we are projecting on that one about an average 32 watt of savings. This is all on Table 9 of the case report. There are many categories with higher savings. We projected an average of 13 watt savings across all categories weighting by the

California sales.

One other thing is as somebody pointed out earlier, in the case of commercial buildings, they are that much more likely, I think, to use the lower wattage Halogen products because they have longer life, and that means less trips up the ladder, and that is someone you are paying $8.00 an hour or whatever the wage rate is. So, the longer life really has an advantage.

We estimate that the majority of energy savings are in commercial. Certainly the majority of peak savings, but even the majority of energy savings are commercial because they are used that much longer now. I have to look up the exact numbers in the case report, but you are talking roughly ten hours a day on a commercial application, roughly three hours a day on a residential application.

When you factor that in, we also think there will be substantial energy savings. Yes, if Pam has some additional data, I would be happy to look at it, we might be able to refine the numbers. Maybe it is not 7.5 watts, maybe it is five watts for that category, but there is significant savings in the other categories. I

think you would be hard pressed not to show substantial savings from this overall proposal. Those are my --

COMMISSIONER ROSENFELD: Steve, could you just summarize? You said average over the cases you considered, you said the average savings was nine watts?

MR. NADEL: Thirteen watts.

COMMISSIONER ROSENFELD: Thirteen watts.

MR. NADEL: If you look at Table 9 on page eleven of the case study.

PRESIDING MEMBER PFANNENSTIEL: Pam, I assume you will give your specific information to Steve, and we will see if we can get some resolution of these issues.

MS. HORNER: I'd be happy to.

COMMISSIONER ROSENFELD: We don't have a fight between angels.

MS. HORNER: We have the white angel and the black angel, but we won't say who is who.

Also I would like to comment that I guess being sort of, in our case, our manufacturing company being kind of a king of the retail national account world, we sell virtually all only halogen to the retail commercial users

today. They don't even use incandescent reflector lamps. The commercial users already see. In fact, they are not even going from 150 to 120 to 90 as Steve suggests using the much better IR lamps and that sort of thing because they see the wisdom in it. In our world on the commercial side, they already use the halogen. They are already doing that. Our people are out there telling them that is exactly the right thing to do, and they see the benefits because it saves them money.

MR. TUTT: Do they use 50 watt or 75 watt halogen or a mixture of the two?

MS. HORNER: There is a lot of use in lower ceiling height now of the 50 watt and 60 watt type par lamps. There is also in the par 38 size the 60 and some use of the 90, it just depends on what they are willing to pay for, and a lot of use by metal halide now by the way. That is an interesting thing, especially in groceries.

Some of the big box retailers who are trying to highlight particular high-priced computer things and such are going to the higher efficacy ceramic metal halide track and wall wash and that sort of thing. Even though it is high

initial cost, but it doesn't address the consumer market, but it would address the commercial market.

MR. PENNINGTON: Can I follow up on that? Are you questioning the two-thirds of the savings for this measure being commercial, are you challenging that?

MS. HORNER: That did surprise me, but I think you are saying -- what I took a look at was installed base, just watts. What you are talking about, the two-thirds savings, you are talking energy savings -- no?

MR. TUTT: I think it is peak savings in the report. I think the energy savings -- the way I remember it, it goes the other way, they are 50/50 or more on the residential side, but I could be misremembering it.

MS. HORNER: Right.

MR. NADEL: They are close to 50/50, but not quite. We estimate 2.66 billion Kwhs on commercial and 1.83 on residential.

MS. HORNER: If you multiply by ten hours instead of 2.3, you get a higher number. If you are talking KWhs versus KWs today, for my short presentation, I was going for the wattage,

but I would be happy to dig into this even further with Steve if that is what you would like the NEMA companies to move forward with.

I also think it might not be a bad idea, I don't even know of a valid study that shows what people will do. I'd love to know.

MR. TUTT: That would be interesting to find out. I would agree. One change in the standard seems fairly small, and it is the change from what was proposed last year, 40 watt category to 41. As I said, that sort of exempts lamps below 40 watts. I know that we had talked in our meetings about a Canadian structure where there were lamps that were exempted below a certain wattage level. I am wondering if this is similar to that and whether there are any comments on that part of this proposal?

MS. HORNER: Our representative Canadian, Joe Howley, can comment on that. I know he is very familiar with Canadian standards.

MR. HOWLEY: The Canadian standard, though, more closely parallels the federal regulation for these lamps in that it does exempt BR lamps in a similar manner. I think they moved the wattage of one of the categories, the 67/66

split, they moved it down to 60 I believe. It goes from 51 to 60 in that one category up on the chart that is being shown right now. Then 60 to 85. I don't think it had any really meaningful affect with the products in the market, they just wanted to prevent any products coming into the market that they viewed might be less efficient than the existing products on the market. I don't think that was a real concern, but they decided to do it anyway.

The big difference with their regulation is they've also tried to or they have placed regulations on the maximum wattage of the so-called BR38 lamps, they blown par 38 lamps. that is really the big significant between the Canadian reg and the U.S. reg. They do not regulate our lamps, our BR lamps with these regulations, those products are exempt much as they are in the federal regulations today.

This isn't really exactly when we say it is similar to Canadian, this is not similar to Canadian. This is basically eliminating the exemption for the BR lamp I guess is the way I would view this as opposed to regulating light the way Canadians regulate.

MR. TUTT: Is there something you would propose to us that would make it more similar to what the Canadian structure, or is that not something that you think would work here in California?

MR. HOWLEY: We have found that to be acceptable in Canadian, and we would have to discuss it. We haven't discussed it yet among our companies, but I imagine that we could probably get agreement to the Canadian type of regulation, and we can pull that out and share that with you in terms of what they've done and point out the differences between the current federal regs and how Canada took it somewhat further.

MR. WILSON: Maybe you could describe briefly what it is what the Canadian concept is?

MR. HOWLEY: Originally, they were trying to simply harmonize with the U.S. regulations and put a regulation in place that paralleled what a U.S. federal government did. In looking at the regs, they added a few additional twists to it, including a lamp type that was uncovered by the federal regs. This is what we call a blown par 38 lamp usually used for outdoor flood lighting. Actually, there is actually quite

a bit of use of that in California. It is a less expensive outdoor floodlight versus a halogen floodlight.

They are (indiscernible) typically 150 watts, not 120, and they are typically made 75 watts not 65. What Canada did was basically to place a limit on the wattage from 150 down to 120 and from 75 down to 65 in Canada. In the U.S., they are not regulated right now, so for the most part, they are sold at 150 watts and 75 watts, that particular product category mostly used for outdoor floodlights.

That is not being proposed here. What is being proposed here is basically elimination of the BR exemption that is placed in the federal regulation right now. Canada did not do that. Again, we could share with you the exact Canadian regulation what was proposed and also point out the differences, how they took it further than the existing federal regulation and our getting some additional energy savings from their particular approach.

MR. NADEL: Yeah, on the Canadian regulations as Joe pointed out are pretty similar to the U.S. national regulations except for the

blown par lamps, so most of the energy savings that we estimate would disappear with the Canadian regulations. You get a little bit of savings, but that fraction of what you had. I did look up what the assumption was regarding use of the halogen.

We estimate that 73 percent of residential sales and not halogen, but only 38 percent of commercial sales and not halogen. That 38 percent was in fact based on some Canadian data. There is limited data, so if there is some new and better data, that would be great, but we do assume that the majority 62 percent already are using the halogen lamps.

There are, particularly I think as Pam pointed out, the large are more sophisticated users. Definitely they are using them. There is a fair amount of small users that may actually just purchase at home depot or somewhere else as a residential customer, and they haven't switched nearly as much.

MR. HOWLEY: The only thing I would say in listening to Pam's comments and Steve's comments is that the Canadian regs that were proposed we would agree absolutely would save energy because they way they are proposed. There

is no question that they would save additional energy above the federal.

The proposed regulation here does -- you have to take into account several assumptions that may or may not be accurate, so as Pam was pointing out, you may get the energy savings if the assumptions go more towards Steve's suggestions or you may not. They may disappear or vaporize. Again, the consumer selection goes more towards Pam's analysis.

MR. WORK: Or go negative.

MR. HOWLEY: Or go negative. That is the difference. Canada is I think would definitely produce energy savings. These may or may not depending on exactly what the consumer chooses to do, and that is based on a lot of assumptions in both analyses.

MR. TUTT: Can you explain, Pam, this is sort of curious to me that a flood -- you know, I tend to think of flood lights as spreading out spotlights as beams, but a 50 ER30 flood is 30 degrees, and that is called a spot for BR 65.

MS. HORNER: One partial explanation for the nonsense of lamp (indiscernible) is that at least in our line up, the 50 ER30, doesn't come in

anything, but just a plain one. So, they call it a flood. It is what it is, it doesn't even have flood after it, it just is.

Then in the description it will say flood, you get 30 degrees. That is it, you don't have any other choices.

In halogen, I can tell you having been through sort of the years of development and listening to our halogen people talk about this, they acknowledge that just because of the shape of the parabolic back reflector in lieu of the sort of reflector shape of the soft glass BR lamps, you automatically get a downward motion of it. So, what they've done is they took the biggest one they could and called it a flood, and they worked from there.

PRESIDING MEMBER PFANNENSTIEL: Are there more discussion on the reflector lamps that we need to have here. We are going to break for lunch at some point, but I would like to finish up this discussion first and then we can talk about how long the discussion will be on the metal halide and get a sense of whether we should go straight through now and try to finish it up or break for lunch.

I am fairly open and flexible, but I don't want to in any way limit further discussion. So, first let's talk about whether we are finished on the reflector lamps now, or is their more discussion there?

MR. WORK: Maybe I will just add something because Joe triggered the thought, but it is a question for the CEC. At what point are you ready to make a regulation. You have sets of assumptions that have such fluidity and some save energy, some cost energy, is that the point of which you are ready to make a regulation, or do you have some substantiation for the assumptions? I think that is an open question.

PRESIDING MEMBER PFANNENSTIEL: Right, it is a question, and it something that Art and I are going to have to talk about and make a recommendation to the full Commission.

MR. FLAMM: This is Gary Flamm. This is just something I've been thinking about. I am assuming -- I don't remember the study, but you are looking at existing luminaires for the most part for the "R" lamps, but in new construction, if the whole base line changed, then I would assume the on-center spacing of luminaires and the

lumen output would be based upon that new base line, and I am wondering how much new construction is part of the -- because all the assumptions would change in new constructions because you would assume that a good designer would change the on-center spacing to meet the foot candle levels and --

MS. HORNER: Frankly, Gary, that was really one of my parting shots that I didn't make is that Title 24, which you are referring to is a perfect marriage with lighting in this case because it addresses that.

MR. FLAMM: I do see a marriage of the Title 24 and Title 20 here because if you added the same wattage lamp with more lumens than the designer would accommodate that in putting fewer luminaires to get the same results.

MS. HORNER: They already do.

MR. WORK: Don't forget the distribution as well, it is not just lumens.

MR. FLAMM: Right, that is why I was just curious how much new construction because it is true existing construction dominates probably the sales, but I am just wondering if the thought process went into what happens if new luminaires

are changed because product -- not new luminaires but the center spacing and the connected load changes because of the base line standard has changed, the base line lamp.

MR. NADEL: We looked a little bit into what if you use the higher efficacy 65 watt BR, and that is a wider lamp and you could slightly increase the spacing. Obviously if you move to a halogen with narrow beam spread, you decrease the spacing, but if you weren't looking for the same level of foot candles, I would assume you would go to even lower wattage lamp, but you balance that and see what made sense relative to the higher efficacy 65 watt, what gave you the best light, assuming there is a lighting designer involved.

MR. HOWLEY: I guess, Gary, my thought on that, I thought you were going in a different direction, but my assumption is that many contractors will put in compact florescent down lights in new residential homes because of the new Title 24 specs. As they do that, it basically makes the case for energy savings worse and worse. That going forward, these fixtures now no longer have incandescent reflector lamp in them. They have pin base compact florescent lamps in them.

The market is slowly drying up for those products. Over time as new homes get built, it is going to make the savings even less on a future projected basis as new homes come in with much more efficient technology.

MR. FLAMM: Actually, I think it is true with residential that you are probably going to be going more towards down lights with florescent, however, I was thinking more in non-residential. Non-residential pays more attention, I believe, to minimum/maximum ratios, but whereas residential I don't really think they pay attention to that.

I think the impact I can see is in non-residential minimum/maximum spacing of luminaires if the base line lamps changed.

MR. POPE: I just want to comment on Joe's comment. I think the stock of existing houses isn't going away. I think what Joe probably means and should be saying is that the overall ratio of new homes versus old homes, you know, is changing over time, but the savings projected in these calculations are based on a fixed housing stock, and that number does not decrease except for some so small amount of remodel work.

MR. SIMINOVITCH: We expect to see a lot of the incandescent down lights still being used in homes in California over the next few years. It is going to be in the kitchen where you are going to see the pin base fixtures, but the rest of the home --

MR. FLAMM: We can't hear you, Mike.

MR. SIMINOVITCH: Michael Siminovitch, California Lighting Technology Center. We expect to see a lot of incandescent fixtures still being used in California homes. I think there are other compliance techniques, such as lighting controls, which we will see a great increase in use. This is going to be cost driven, so I think in the kitchen you will see pin based fixtures, but in the rest of the homes, we have seen a tremendous amount of down lights. A third to a half of the down lights are outside of the kitchen.

Do you see that as being still under the BR30 as the dominant lamp on those non-kitchen down lights?

MR. SIMINOVITCH: It will be an Edison socket which could take a variety of lamp approaches, and that is being determined here.

MR. TUTT: When somebody remodels their

house, the kitchen particularly will have to meet the new kitchen lighting standards, is that correct?

MR. FLAMM: That is true.

MR. TUTT: There might be in the existing stock of homes as remodels happen over time, a reduction in the number of homes that have screw-in down lights?

MR. FLAMM: In the kitchens, that's true, that's assuming that building permits are required.

MR. TUTT: Or obtained.

PRESIDING MEMBER PFANNENSTIEL: Steve, go ahead.

MR. NADEL: The assumption we made was that there are 30 million of these lamps sold each year that does not increase or decrease over time, so all the new construction, you know, we are pretty much saying it is the existing stock, not counting too much on new construction.

PRESIDING MEMBER PFANNENSTIEL: Further discussion then on reflector. Then let me ask, should we press on and finish this and all go have a nice long leisurely lunch, or I really want to minimize or cut short in any way the further

discussion on metal halides. So, what do people feel. I don't have much of a sense of how long that discussion might go. How is peoples --

I would say a ten minute contribution on metal halide.

PRESIDING MEMBER PFANNENSTIEL:

MR. NADEL: I have no idea what he is going to say, so how long I need to respond, I have nothing new to add except to respond to what he may say.

PRESIDING MEMBER PFANNENSTIEL: Art, what do you think? Press on or --

COMMISSIONER ROSENFELD: Press on.

PRESIDING MEMBER PFANNENSTIEL: Press on, here we go.

MR. WORK: My name is Dale work again from Philips Lighting, and my comments here are not so much from the NEMA Lamp Section as they are from the Ballast Section.

My comments today are not geared to the conversion of probe-start to pulse-start, they are really focusing on the ballast efficiency formula that shows up in the draft report.

Right before I have some umbrella comments, and then I have five specific points I'd

like to make, and then I will give some conclusions. Maybe first of all I'll give some bias.

I think, and we have other NEMA companies here, that all NEMA companies probably have a bias to convert their other HID offerings to metal halide, so I think we come from that common point of view.

I think that NEMA ballast companies all very much want people to convert to electronic ballast. That is their newest, latest, and greatest, etc.

I give those bias' because certainly my conclusion is going to be that it is certainly too early to have performance standards on electronic ballasts. This comes from the ballast people. Despite the fact that they would love for people to buy their newest, latest, and greatest.

On the proposal, as set forward in the draft report, uses some words that we don't think match the formula given. The proposal is to set minimum lamp ballast system efficiencies. To set those efficiency limits from metal halide luminaires, and we presume this is to save system energy, that energy could be saved from the lamp,

it could be saved from the ballast, it could be saved from the combination.

As we see it, the formula given is only related to ballast efficiency, so we see a mismatch there between what is intended to be done and what the formula calls for.

Also because of the experience with florescent lamps, it is very tempting to think that electronic ballasts are intrinsically more efficient, the magnetic ones. That is sometimes the case, but it is also not the case. They are not intrinsically more efficient than the magnetic.

The performance standard that only compares watts out versus watts in for the lamp ballast system will not significantly favor electronic ballasts. Now there is a number of reasons for using electronic ballasts with metal halide lamps other than efficiency, and we think there are some good reasons for that. We think this meeting is really focusing on efficiency and energy saved, so I don't say much about that.

If the intent of the proposal is to promote the conversion to electronic ballast for some other good things it can do for the lamp,

then the performance standard needs to be changed to indicate that. It should not only have the ballast.

My comments below, my five specific points are really given under the assumption that the intent of this proposal is to drive conversion to electronic ballasts. The reason I think that is because of the earlier supporting technical document from Stan Walerczyk has that explicit statement in there. If that is not the case, then you can sleep for the next five comments.

MR. FLAMM: Good, this is Gary Flamm. It is my understanding that the line was drawn at electronic ballasts, but this was written in a way to accommodate magnetic ballasts that would reach the efficacy because it is my understanding as you go higher in wattage, that you are more likely to reach the efficacy, or it is easier to reach the efficacy with magnetic ballasts. In an attempt to be technology neutral, you draw the line at electronic ballasts, but that also gives the industry the option to meet the efficacy with --

MR. WORK: With any technology.

MR. FLAMM: Pardon?

MR. WORK: With any technology.

MR. FLAMM: With any technology, and it allows some unknown something you guys have hidden on your benches to meet that efficacy.

MR. WORK: Fair enough. I base my statement on Stan Walerczyk's document prepared for this group that said standards requiring electronic ballasts are also cost effective and achievable and are therefore also recommended. That is what I felt was behind the absolute standard.

I'll make the comments and when they are not askable, you'll forget them. The first is, and it is recognized in the proposal by the way, that electronic ballasts have somewhat limited application scope. You certainly cannot use electronic ballast as opposed to magnetic ballasts in many applications. The proposal recognizes that for example in high temperatures. Electronic ballasts will not take nearly the temperatures that some of the magnetic ones will.

What the proposal does not recognize is low temperatures however. Magnetic ballasts will also take lower temperatures than electronic ones.

Outdoor applications are largely or partially excluded in the proposal. That is a

good thing, but we also notice that there are application limitations in terms of transient voltages and vibration requirements that were not mentioned in the proposal.

The proposal does mention, and we are glad to see infant voltages because there are not electronic ballasts available at 480 volts for example.

The second point, and I think much more germane to the discussion this morning is the very limited field experience with electronic ballasts. Please remember that my comments are coming from the ballast people.

The field performance and reliability of many electronic ballasted systems is not well documented, even for the applications where they are used. New technologies often undergo some growing pains and some early design revisions based on field experience, and caution should be taken before mandating the conversion without solid supporting data. I think that would be their main point is they would love to see people driven to electronic ballasts, but they don't think this is the time to do it.

The third point is the assumption of

higher ballast efficiencies can be questioned, and I appreciate the comment from across the room, maybe that wasn't included. It is very tempting to think that electronic ballasts are more efficient that magnetic ballasts, and that is certainly not always the case.

COMMISSIONER ROSENFELD: Dale, can I interject, I want to try to understand this. Electronic ballasts got a good name because for florescent lamps I think it was originally discovered that 800 cycles used by the Navy was more efficient than 60 hertz, and then of course the electronic ballast could be any frequency you wanted and sure enough, they were more efficient.

Now are you telling me that is just irrelevant for metal halide lamps? I'd like to get some understanding --

MR. WORK: Irrelevant is a strong word, but I will make the following statement and I have a knowledgeable colleague here who can correct me. In florescent ballasts -- if you say electronic florescent, you mean high frequency.

COMMISSIONER ROSENFELD: Yeah, yeah.

MR. WORK: When they are used at high frequency, you have intrinsic electrode losses

that go down.

COMMISSIONER ROSENFELD: Right, that is the point that I was trying to make.

MR. WORK: That is not true in HID ballasts, in metal halide ballasts. You do not have that. It is very tempting to thing that, but that is not the case.

COMMISSIONER ROSENFELD: Sure, but we've all been trained --

MR. WORK: Tom, would you agree with that?

MR. NADEL: You don't have the frequency difference with the HID that you do with florescent.

COMMISSIONER ROSENFELD: (Indiscernible.)

MR. WORK: You don't have that electrode energy saving difference, yes.

MR. HARDING: This is Tom Harding, Rancho Lighting. There is a savings, but it is a lumen depreciation. If there is a savings, it is not the initial lumens per watt of the lamp are different. The fact is, all the measurements we've done is that it is at most one or two percent, which is kind of lost in the noise.

Lumen depreciation appears to be less with electronic ballasts. That is where there can be energy savings, but the ballast itself is not -- electronic ballasts are not that much more efficient than many of the magnetics out there, just power in and power out.

COMMISSIONER ROSENFELD: Okay. Thanks.

MR. WORK: In fact, on this energy savings, it is important to distinguish when you talk about electronic metal halide, that there are two kinds out there. With florescent there is only high frequency, but in metal halide, there are two kinds of ballasts out there. The most common type is a low frequency square wave, a low frequency ballast. It has efficiencies, according to the ballast people, of the number they gave to me was 83 to 90 percent. It is in that category where many magnetic ballasts, the most common magnetic ballasts also in the mid 80's, so the time is about a wash there.

There are magnetic ballasts out there, however, called reactor ballasts is the name to go by, that are more efficient than that. They have other problems, but if you only want energy efficiency, the magnetic reactor ballast -- you

might drive the market to that unintentionally.

There are high frequency metal halide ballasts, and they have efficiencies about in the range of these magnetic reactor ballasts that I talked about, but they are about comparable.

I want to say is that only the low frequency ballasts are anywhere in the standards process. So, there are no standards even discussed for high frequency metal halide ballasts there are for low frequency, even though to my knowledge, no standard exists today, but it has been discussed for several years, and I think it is getting close.

MR. HARDING: Yeah, that is true. We are very close to it, a square wave electronic ballast standard, both in the ballast group and from the lamp specs, and the feeling is that is the model for the second stage which will be electronic high frequency, get the first one done.

MR. TUTT: Those are ANSI standards you are --

MR. HARDING: ANSI standards, you are right.

MR. WORK: I'll read the statement that came directly from the ballast company, not

Philips, but Philips Ballast Company. In any case the lamp ballast efficiency given by the formula in the draft report for the higher wattage lamps are neither technologically achievable at the present time nor expected to be achievable in the next few years.

I know in talking to Tom, he said maybe the most efficiency might barely be achievable, but basically those standards are not realistic for either magnetic or electronic ballasts, so I am not sure where the formula came from, but it needs to be revisited.

MR. FLAMM: Gary Flamm again. What do you consider the higher wattage, we have it broken down between --

MR. WORK: The higher wattage here goes up to 500 watts. So, I would consider the 400 to 500 range would be the higher wattage.

I've already covered the point about you can't extrapolate from the florescent ballast, so I am going to skip that here, but I will come to another point that is built into this formula. Again, this comes directly from the ballasts companies.

The efficiency formula in the draft

staff report indicates that lamp ballast efficiencies increase at higher wattages. There is a formula in there. The ballasts companies know of no evidence to support that, it is not their experience.

Now I will just give the conclusions. It is too early to force conversion to electronic ballasts. The needed technology is just not available for many applications and where the technology is available and applied, there is too little field experience to warrant a wholesale conversion.

The second conclusion is electronic ballasts are not intrinsically more efficient than all magnetic ones. A rationale besides efficiency is needed to justify such a forced conversion. In going forward, you may want to look for such reasons because electronic ballasts do have some other advantages.

The third conclusion, if the push to electronic ballasts is predicated on more efficient lamp performance in these systems, then this improved lamp performance needs to be documented. I find no documentation for that. This improved lamp efficiency needs to be part of

the performance standard in the document. You shouldn't have the formula have if that is the reason.

Finally, just repeating the sentence from before, the efficiency is given by the formula for the higher wattage systems are neither technologically achievable nor expected to be achievable in the next few years, by either magnetic or electronic product offerings.

Again --

MR. FLAMM: You are saying that in the next few years, you are aware that this is pushed all the way back to 2009?

MR. WORK: Actually, what they gave, they gave me, not my numbers, they said in the next five to ten years. I said the next few years. Thank you again for giving us the chance to comment on this part.

PRESIDING MEMBER PFANNENSTIEL: Thank you very much, Dale. Steve, do you want to comment now, or is this something that we would exchange some information before we give further comments?

MR. NADEL: I can make some comments now, but some of it I am going to have to check a

few things, and I can't do it immediately.

Let's see, again, it is useful to have comments, and we appreciate that. It has a been a year and a quarter since we put these out, so for future reference, it would be nice to get more timely feedback because that will help the CEC process to move forward.

MR. WORK: On the other hand, I would say on the same token, as you develop these, it would be nice to have dialogue, so that we have this built in and not only have to respond to written documents.

MR. NADEL: On that regard, we began this by meeting with the NEMA Lighting Section in San Diego. I had several subsequent interaction with various people in the NEMA Lighting Section before even the first draft came out, so we really did make an effort going back to at least 2003 --

MR. WORK: Especially the ballasts people, okay, I accept that, Steve.

MR. NADEL: In particular, that meeting in San Diego was with the whole lighting section including specifically the ballast, the fixture, and the lamp people were all --

MR. WORK: Okay, we will discuss that

off line. I was present for that 30 minute session.

MS. HORNER: Right, so was I.

MR. NADEL: Maybe there needs to be some ways because I worked through NEMA staff, and I thought they were checking with all three sections, but I can't promise if they were. So, I sense some I'll say general agreement that the high efficacy ballasts are appropriate in some applications, not all. That you don't disagree with any of the exceptions that we have presented, and I have to look at the details, but you are suggesting one or two other areas that we may want to look at. I would appreciate the details on that, and we can look at it. It looks like we are mostly in alignment on that one.

MR. WORK: Yes, I think so.

COMMISSIONER ROSENFELD: There was something about low temperatures as well as high --

MR. NADEL: There is low temperatures and something about I think high transient.

MR. WORK: Vibration and transients, right. Street lighting for roadway lighting.

MR. NADEL: Vibration. I am assuming

your written comments, there is some more details on this that you can give us.

I think also as Gary pointed out, we do want to clarify, this is not strictly a technology standard. In general, it will tend to favor electronic ballasts, but if you look at Figure 3 in the case study, we do show on this one, I count five magnetic ballasts that pass. We want the most efficient ballasts, we don't care whether they are made out of ceiling wax, although they need to last long enough to function properly. So, it is not a technology standard.

You asked about what the formulas are based on. We collected all the available data at the time from manufacturers on the performance of their ballasts that they provided to us. So, it is based on manufacturer data. I don't have it right with me, but it was a spread sheet that was provided for the record that says here is all the ballasts that we have, and here is the data.

We did best fit lines. So, either these are ballasts are produced that demonstrated it, or which will not be the first time it has happened in the lighting industry manufacturers may be shall we say optimistic in their projections.

There may be some problems with the data that the manufacturers are reporting both to us and the consumers.

MR. WORK: I think that underscores, again, the point I raised twice about we need field experience there because it is very common to introduce something and then have to revise it and come down.

MR. NADEL: Right, I mean these are manufacturer ratings for products that these are not future projections, these are for products that they are selling today. We only looked at existing product on the market, existing manufacturers spec sheets. It is not projected, it is what the manufacturers are in fact claiming.

MR. HARDING: Steve, I just need to make one small point on that. I know on the electronic ballasts manufacturer will tell you that his efficiency is 93 to 96 percent, 94 is what this formula calculates. That is based on -- it depends on what the line voltage is. It can vary that much on whether you are putting 200 volts into or 280 or 290 volts into it, 277. So, it isn't lying, it is just there is a huge range to it. It makes those numbers hard to reach and for

example, 94 would be hard to reach if you had 200 volts going into it. The standard doesn't incorporate that.

MR. NADEL: Right, I will have to check into that new data.

Let me finish taking a note here.

MR. HARDING: In those websites on electronic ballasts are changing daily I think.

MR. NADEL: In terms of the field performance, my understanding and Stan Walerczyk is the expert who we worked with closely on this, and he actually wrote significant parts of this, he is one of California's foremost lighting application experts. He does an awful lot of work in the field, and he says basically in the last year, these products really have come of age, but as Gary pointed out, we are talking three to four years hence before these standards would go into effect.

I think it is quite safe, and if in the highly unlikely chance that some problems occur, then the Commission could make adjustments in the future, although I really don't think that will be needed.

Those seem to be the main points that

they made. I'll have to check back into the data. Maybe we should compare some notes and see whether the manufacturers are prepared to stick by the data. I will check into to see whether some specific voltage ratings that may not be your standard voltages for example. Yes, I am aware of all the games one can play with reporting data.

Those would be some initial comments just taking a stab.

PRESIDING MEMBER PFANNENSTIEL: I do hope that the information, then, will be exchanged to the point where it will allow the Commission to assess all of this. I think that clearly there is information that I don't think anybody is hiding or anybody is misinforming, I think it is just a matter of exchanging it timely so that we can build it in and look at it correctly.

COMMISSIONER ROSENFELD: I have a question for both Dale and Steve. There seems to be this issue that the manufacturers data maybe let's say helpful, and that we ought to pay more attention to the field data. I don't have a clue -- I'm looking at everybody -- as to whether field measurements come or test procedures, I am just thoroughly confused. Is there a helpful

recommendation to make here?

MR. NADEL: I think there are two issues, and I'll let Dale comment. One, when we set these standards, it is based on testing in the laboratory under standardized test conditions.

COMMISSIONER ROSENFELD: You'll comment about taking the most optimistic voltage, working with the voltage that shows that it shouldn't really --

MR. NADEL: I think what he may be arguing is we have to look very carefully at what voltage they report they tested at. It is laboratory data, but did they in fact only use non-standard voltages in order to get better performance, and we have to --

MR. HARDING: 208 is a standard voltage as is a 277, it just that it gives a range of efficiency of the ballast instead of just one number for a ballast.

COMMISSIONER ROSENFELD: Can you folks agree before the next --

MR. NADEL: I'm sure we can.

MR. HARDING: Oh sure, it is right off their website.

MS. HORNER: Sure.

MR. NADEL: Right, Tom we've talked to. He is well aware of what a lot of competitors do, and he may know some of the games that might be played.

MR. HARDING: I don't think it is a game.

MR. FLAMM: I am curious if there can be a voltage factor added to this formula? Does that make sense?

MR. HARDING: It may on some of these electronic ballasts to do that. They are very flexible in terms of you can put any voltage between 200 and 300 volts into most of these, but efficiency changes as you do that.

MR. FLAMM: Is there kind of linear relationship where you can actually put one more factor in this formula that addresses voltage?

MR. HARDING: Maybe, maybe we will have to look at that.

MR. NADEL: It is possible. I'll have to look at the data, but also see if we can clarify whether the manufacturers are really prepared to stand behind this data.

That's the laboratory testing data. I think the second issue is the manufacturers are

saying, well, we don't have a lot of field experience with these products, and until we get a lot more experience in the field with these products, you shouldn't go forward.

That is how I think they get field. Ultimately, the standard comes down to laboratory testing, not field testing.

MR. WORK: On the field testing, I would comment -- well, I've already said it. I won't repeat myself.

MR. HOWLEY: This is Joe Howley. I've got two additional comments on this that Dale didn't raise. One was that we did do a survey on the horizontal pulse start metal halide lamps in terms of the availability, and the survey came back that most of the horizontal pulse start products from at least three manufacturers would be available some time in the year of 2008. I note that you have January 1, 2008, and I guess not knowing exactly when these products would be introduced in 2008 by the final manufacturers, we were discussing a date a more like December 1, 2008 or perhaps January 1, 2009 for the all standard based on that survey.

We did mention last time that we were

conduct a survey and see when we thought. It is close. It is close, it is probably sometime between January 1, 2008 and January 1, 2009, we would expect to have in most wattages horizontal pulse start metal halide lamps available by at least three manufacturers.

The second comment is that one area that we did not have products and nobody was proposing to have products was the 175 watt. There are 150 watt lamps available, but the 175 watt did not appear to be available by at least three manufacturers.

I do note, and I am reading this for the first time this morning, there was a letter that was sent in by Cheryl English at Acuity Brands that has been passed around. It hasn't been discussed at all here, but just maybe to give Cheryl a little bit of -- I know she worked hard on this. I am reading it really quickly, she put a lot of effort into this, and she seems to have analyzed the fact that one, she had a concern about the 175 watt. Two, she had a concern about outdoor fixtures and about the availability in some of the outdoor fixture types. Three, she had a comment about the availability of products for

base down.

We normally don't see base down lamps used in too many indoor applications, but they are used for post tops and outdoor applications. She had some percentage here that it is a very small percentage of the market, perhaps it looks like six percent of the market.

Only a couple of products are really rated for base down operation, and we did not do the survey to try to capture this nuance. We only did it for horizontal, but it appears we are going to have to look more carefully and perhaps for the September meeting at this issue of outdoor and post top base down lamps and whether those products would be available for all products.

In saying that, I do note that the existing regulation scheduled to come into effect January 1, 2006 essentially covers those types, but I am also noting that obviously fixture manufacturers are raising a couple of issues with that.

COMMISSIONER ROSENFELD: You said outdoor and what, post?

MR. HOWLEY: Yeah, base down lamps. Lamps that operate --

COMMISSIONER ROSENFELD: You said -- post top.

MR. HOWLEY: An outdoor post top fixture. Her proposal was either you put an exemption for outdoor or an exemption for base down. It sounds like she would be satisfied, but perhaps you could look at it in either way because it seems either exemption would cover her particular issue that she raises.

MR. NADEL: Just to clarify, Joe, it is not too problems, it is a problem that she is alleging, and I haven't had a chance to look into this with vertical base down fixtures that are used outdoors. One set of fixtures --

MR. HOWLEY: On pulse start ballasts, right. Lamps rated for pulse start that are used based down outdoors seem to be a problem. There are a couple of products available, but it is very limited.

MR. NADEL: Right, but I am just saying it is not two problems, it is one problem, and I will look into it. I don't have --

COMMISSIONER ROSENFELD: Again, just a technical question. Why is it only outdoors that one wants to go base down, and does that have to

be? I don't get the picture so to speak.

MR. HARDING: This is John Harding. I am not a luminaire manufacturer, but it seems like there aren't very many luminaires in this world of metal halide for lighting for base down operation.

Base up in most high bay applications where metal halide is used is just as very easily to work with.

MR. SIMINOVITCH: It is just the design of the fixture, or that is the way it is designed, particularly for decorative fixtures which are glass, we don't want wire up and then down in the sockets. You have the socket in the base. You use it a lot in decorate post tops.

COMMISSIONER ROSENFELD: Post tops.

UNIDENTIFIED MALE: To look like old gas lanterns.

MR. SIMINOVITCH: Yeah. Don't wire up and then wire down.

COMMISSIONER ROSENFELD: You don't want a shadow.

MR. SIMINOVITCH: Or if you have a glass surround.

COMMISSIONER ROSENFELD: It is the acorn type fixtures that you see all around here.

MR. SIMINOVITCH: You will see a lot more increase with the move towards metal halide.

UNIDENTIFIED MALE: It represents a big market here for some of the new manufacturers for outdoor.

COMMISSIONER ROSENFELD: Thank you.

MR. WORK: I have a question for the CEC again. One of the points that the ballast manufacturers raised had to do with standards, that there are only standards even in progress for the low frequency electronic ballasts.

How does the CEC feel about the need for standards on things to be regulated and things to be mandated?

MR. NADEL: You are talking ANSI standards just to clarify? I am just clarifying for that.

MR. WORK: I am talking ANSI standards, yes. That's fine. Standards to insure interchangeability, and agreed upon test procedures.

MR. TUTT: All I would say is, no, this came up in our discussions throughout this spring, this fall, that the ANSI standards weren't in place for some of these particular size

categories --

COMMISSIONER ROSENFELD: I am sorry, were not?

MR. TUTT: Were not, correct. It seemed like the time frame for developing those ANSI standards was pretty long out into the future, and so I think we were at least prepared to discuss going forward with energy efficiency standards prior to that ANSI standard process being completed.

MR. WILSON: Yeah, I thought we took the anticipation of standards being developed into account when we put in the dates here.

MR. WORK: John, does that mean that you anticipate those standards will be in place by the time this kicked in?

MR. WILSON: Yes.

MR. HARDING: The square wave should be in place within a year. The high frequency one is probably two to three years away.

MR. WORK: The square wave will not meet their formula in most cases.

MR. HARDING: No, that's correct. The efficiency of the square waves is not going to probably meet your formulas. The square wave

electronic is less efficient than high frequency electronic.

MR. WORK: Tom, would you agree that the need for standards on high frequency is greater because of all of the thousands of acoustic residence problems with metal halide lamps?

MR. HARDING: It's at least as great. I am not sure if it is greater because you can have acoustic residence on square wave if you don't get those right.

MR. WORK: Not low frequency square waves.

MR. HARDING: Yeah, you can. The high frequency (indiscernible) on the square wave can give you acoustic residence.

PRESIDING MEMBER PFANNENSTIEL: Steve, did you have a comment?

MR. POPE: I just have a quick question for Joe. The survey you mentioned, is that something that you are sharing with the Commission at some point? Secondly, could you just clarify you said late 2008 seemed realistic. How did you present the survey? Is that if there is a standard in place, this is the soonest you can get there, or you guys are going in this direction,

when are you going to get there?

MR. HOWLEY: The second one. We are all heading in that direction anyway. This was an emerging technology before California got involved, we were all producing pulse start technologies. Verticals came first because of the volume of those lamps were much higher. We were questioning our members simply they would have horizontal lamps available for use on pulse start ballasts. The survey was done in a way, a proprietary survey because of the proprietary company plans.

What we were trying to get at is at what date because California asked us for a date. What date would at least three manufacturers have products available that covered the main primary wattages in the marketplace. The date that we got out of that survey was either probably December 1, 2008 or January 1, 2009, we would feel comfortable that we would have at least three manufacturers products available. The survey itself won't be provided because it is used for proprietary survey based on individual company plans.

MR. NADEL: Can the survey be provided in confidence to CEC so they can look at it,

including when different products come available because we did our own informal survey with a number of manufacturers, at least for the most part, we think it is going to be well before that.

MR. HOWLEY: We could -- we'll discuss that.

MR. NADEL: I mean somebody needs to look at the data is all I am saying.

MR. HOWLEY: Yeah, we can discuss that or perhaps show them visually the survey without leaving it behind.

PRESIDING MEMBER PFANNENSTIEL: Yeah, I'm a little reluctant to take on information that we are going to use in a public process that is confidential to us. So, maybe we need to resolve this, and maybe we can talk about the different results.

MR. NADEL: Or maybe there are ways for us to work with you. We've sometimes done that. Again, I don't know the particulars on sharing the survey, yeah.

MR. HOWLEY: We could talk more detail, Steve, about how the survey was conducted if you like.

MR. NADEL: Okay.

MR. TUTT: I just had one other question to raise. That is, as we work through this category of luminaires, this spring we talked about phasing in in different size categories, which we have done a little bit in these proposed standards, but I just wanted to throw out as we move forward on this, are these the right size categories. Would you propose other ones, should we do things differently in terms of size categories than we are currently proposing?

MR. HOWLEY: For metal halide?

MR. TUTT: Yeah. We don't have to answer the question now of the top of your head. As we move forward, I'm not confident that we've put together the size categories that make sense to you guys. I want to take that into --

MR. HOWLEY: We can take that into consideration during our discussions over the next month or so whether this wattage size categories are appropriate.

PRESIDING MEMBER PFANNENSTIEL: John.

MR. WILSON: One of the things I've learned in the past months is that metal halides -- I am talking to Tom and others, was that one of the advantages of electronic ballasts

was as Tom just mentioned was light output degradation. One of the advantages of electronic ballasts wasn't necessarily just the initial condition, but the life cycle. If you took that into account, you can install a lower wattage lamp at the outset. I don't know how that was taken into account in the case study and whether or not your comments here took that into account.

COMMISSIONER ROSENFELD: Further before you even answer that, I keep asking and trying to understand this industry. I am looking at Tom. Why is there less degradation with electronic ballasts?

MR. HARDING: We could have a long discussion of this, but I think the simplest answer is that electrode (indiscernible) evaporation of the electrode is less because the average -- there is no peak temperature to the ballast --

COMMISSIONER ROSENFELD: That is why you make it a square wave?

MR. HARDING: Yes, a square wave or even high frequency. You don't get these high temperature fluctuations of the electrode giving you excessive tons to evaporation.

COMMISSIONER ROSENFELD: Is that short enough for you?

PRESIDING MEMBER PFANNENSTIEL: That's great.

MR. WORK: I think, and Tom we talked this morning about it, but just going to pulse starters, you are doing, already captures most of that maintenance. So, that is a very good thing. There is more. Tom and I argued over a word. I would say that sometimes and Tom said usually electronic ballasts high frequency gives better maintenance, but pulse start addresses --

MR. HARDING: Starting -- the blackening during starting. Electronic ballasts only addresses that, it addresses the run mode of the evaporation of tungsten.

PRESIDING MEMBER PFANNENSTIEL: John, did you get your question?

MR. ROSENFELD: No, I interrupted it, I'm sorry.

MR. WILSON: How do we take into account the ability to install a lower wattage lamp initially?

MR. WORK: When you go to your probe start to pulse start regulation, isn't that your

intention then? If you just substitute at 400 rep pulse start for 400 probe start, there is no energy savings. There is no energy saving in the ballast or in the lamp. If you substitute a 400 watt pulse start for a 400 watt probe start, everything else being the same, you use the same energy.

John, to your point, if that standard means, though, yes, but you want them to be fewer luminaires or use a lower wattage lamp to begin with, there is where your energy savings are.

COMMISSIONER ROSENFELD: How big is this degradation over the life of the lamp?

MR. HARDING: In terms of probe start to pulse start?

COMMISSIONER ROSENFELD: Yes.

MR. HARDING: Most manufacturers list a mean lumen maintenance rating of about 65 percent, 65 to 75 percent for a probe start and somewhere around 75 to 80 percent for a pulse start, and 80 to 85 percent for electronic. Some people even considering 90 right now on electronic.

When you start at 65 and work up in those increments, there is a considerable of light maintained over time.

MR. HOWLEY: That is based on lumen maintenance as opposed to these regs which are trying to get at it based on the initial efficiency which is why it is so hard because you are getting at it from the maintained mode which is where you get the benefit. You are trying to write a reg around it at the initial phase which is the difficulty that is being had here.

MR. TUTT: Just in terms of industry practice, though, in vertical installations, the industry has moved towards pulse start ballasts. In most applications, I understand it. Has that also resulted in lower wattage lamps being installed because of that generally?

MR. HOWLEY: Yes. Any designer that is designing that is going to take advantage and try to lower the energy use. Plus today in most states, you have state energy codes (indiscernible) Title 24 is getting at that in California. The designers are using the pulse start lamps to meet the lower watts per square foot numbers.

MR. NADEL: Just to illustrate, in the case study, the most common application was your standard 400 watt lamp. If it was a probe start,

with pulse start those are typically being replaced by 350 watt lamps, and then we model it with an electronic ballast with a 320 watt lamp taking credit for some of the savings, although not the most aggressive savings that Tom was talking about.

MR. WORK: It is considerably (inaudible).

MR. TUTT: Anything else on --

MR. HARDING: I know how to answer John's question which is how do you get at that in a standard? I don't know how to get at that. I don't know how to tell you how get it out of the standard. The standard just looked at watts in/watts out.

MR. NADEL: If you look at the available data that we do have, the electronic ballasts do tend to be higher efficiency, not all of them, but most of them are higher efficiency. Efficiency does allow you to differentiate, so there is the overlapping between the efficiency and this lumen maintenance issue. It is not like it is a one to one correspondence.

MR. WILSON: So, Dale when you were saying, there were linear ballasts --

MR. HARDING: Reactor ballasts, 277 volt reactor ballasts are almost as efficient or just about as efficient as the electronic.

MR. WILSON: What about lumen maintenance?

MR. HARDING: Not quite as good. Sort of between the old CWA pulse start and the electronic, sort of halfway in between I think.

MR. WORK: I have not seen data for that, so that is one of the comments if there is a case history made, we should see the data for it.

PRESIDING MEMBER PFANNENSTIEL: Pam, you had a comment on this.

MS. HORNER: Pam Horner with OSRAM Sylvania. One answer potentially for John's question as to how do you get at the potential energy savings for this combination of pulse start technology and perhaps this electronic ballasting that would go with it is you might try to find some expert retrofitters who can give us some data because this is aimed at new luminaires which is the correct way to go.

Sometimes new luminaires go into holes that were already there or spots that were already there. So, you are talking about retrofitting and

some percentage of those which I am assuming is going to be very high. They don't change the spacing, they don't even take advantage of the fact that they could do something, there are just going to maybe go to a lower wattage and that is it. Those would be known. If you get a good retrofitter who understands that.

Then there are some small percentage of when get out the whole installation, bring in new luminaires, it is not a new building, but then they will got to the trouble to do the respacing, so you will have that, then that would contribute to having a better understanding of the energy saving potential.

Then there is the third category which is just all new construction, and you could make some pretty good assumptions that the design from the get go would try to take advantage of the combination of efficiencies. So, maybe that is where we could utilize the field experience of some really good retrofitters out here in California who could help us get at that. Does that help answer?

PRESIDING MEMBER PFANNENSTIEL: One last comment on this. One, two. Go ahead.

MR. PITSOR: This is Kyle Pitsor with NEMA. Joe Howley mentioned the letter from Cheryl English from Acuity Lighting. She raised six different points in this. I just wanted to know three of them. One is that the exempted outdoor luminaire definition, there is a question in terms of that definition. Could you clarify it relative to what location and the 55 rated ballast which we would like to work with you on going forward?

The reading that we have of this is that outdoor luminaires would be regulated under this in as much as the outdoor fixture does not necessarily contain this particular type of ballast, the 55 degree rated ballast.

Secondly, she did prepare a list of availability of pulse start lamps and all the different categories from four NEMA members showing current availability in the different ratings, energy consideration, the fact that there is not sufficient availability in a number of these ratings to mandate this at this time.

Lastly, to the question and discussion on the vertical burn position base up base down, she did have an analysis here of the different type of luminaires in the outdoor area and the

issues related to the vertical burn position that we talked about in terms of the outdoor posts.

PRESIDING MEMBER PFANNENSTIEL: I would like to suggest that since we haven't had a chance to look at this, that it is not going to be very useful for us to hear that this letter is there, but perhaps we can ask for it to be entered into the docket and that way we can consider it. That's fine. Steve, did you have a comment?

MR. NADEL: A couple of things now, and I know we want to --

PRESIDING MEMBER PFANNENSTIEL: I want to stress at this point, I think there are a lot of very important technical discussions left to be had, and I don't want to keep them from being discussed here, but this may not be the most useful place to raise a lot of the technical issues.

So, let's get through what really needs to come up to the Committee.

MR. NADEL: I understand, right. Pam suggested working with an expert retrofitter to help us make the energy savings. We did that. Stan Walerczyk is one of the foremost ones here in California, and he was heavily involved in helping

give advice on what you should analyze, what assumptions you should make and so on, you know. Is it perfect, could you have done an analysis that is three times as complex, absolutely. We were trying to get an approximate approximation here.

In terms of Cheryl English's question about is the intent to exempt all outdoor luminaires? No, the intent is to exempt places where they are likely to have high temperature that is not going to be conducive to electronic ballasts, so we said in order to be exempted, they have to have a ballast that is rated at a high temperature.

If it is not rated at a high temperature, why do you need a magnetic ballast as opposed to an electronic. So, if someone did install a high temperature electronic ballast because they expected the high temperatures, then they are exempted. That was the intent. She may have additional comments on that, but I wanted to express that.

I guess the final comment I had, and this is helping to move on because I think the next and last thing we will do is schedule a next

meeting. One thing that would be very helpful, a lot of this information has been out there for more than a year, and I am --

COMMISSIONER ROSENFELD: I think I've heard you say that before.

MR. NADEL: Right, I'm trying to keep giving comments, but at some point, there needs to be kind of deadline for comments so we can move on. It also is very helpful to get if there are any additional comments, get the comments in enough time that we can respond as opposed to -- this is about the fourth or fifth meeting I've been at to discuss these things, and then all of the sudden there is new.

As we schedule the next meeting, I would recommend establishing a date, call it one week in advance saying any new comments are due by this date, then we can have a discussion and resolve things because I feel that we are on a treadmill, and it keeps going on and on and on and on.

PRESIDING MEMBER PFANNENSTIEL: I feel the treadmill myself. I really would then like to move to -- think of a date in September by which we have made some commitments to get hopefully some real progress here and have resolved some of

these issues, and specifically looking for NEMA proposals, where they exist. I think that we talked about the general service incandescent lamp proposal by then as well as some other technical if not resolution, at least have all the information on the table in the other two categories.

In terms of a date in September --

COMMISSIONER ROSENFELD: Wait a minute, Jackie. I heard that it would take a -- I don't know, I think I wrote down that it would take a month or so within Philips to get some sort of consensus and then NEMA has to get together. So, I'm just giving Dale a chance to question the September thing if he has the courage.

PRESIDING MEMBER PFANNENSTIEL: Is September not going to work? I thought we had said before that it looked like something like that, and that Joe had also seemed to think that we could get there by sometime in September.

MR. HOWLEY: The one thing, I am looking at our schedule. NEMA is planning a division meeting the last week of September, and it may be helpful for us to have that meeting to meet to go over last issues before we meet here at the CEC

because we will have all NEMA members at this meeting.

That is the week of September 26, right now we have the schedule.

PRESIDING MEMBER PFANNENSTIEL: Then we go to the beginning of October.

MR. HOWLEY: Yes, it might be helpful to move it into the first couple of weeks of October.

PRESIDING MEMBER PFANNENSTIEL: I would certainly hope that by the time we get there, we will have made significant progress from where we are today. I think that is a long ways into the future, and many of us feel a little frustrated at not having made as much progress as we have made since last December when these things were on the table.

MR. HOWLEY: Okay. Do we want to try for the week of October 10? I don't know how you normally do this. There are so many stakeholders here.

PRESIDING MEMBER PFANNENSTIEL: John, is there a restriction on scheduling, is that what we are working -- I don't think we can actually set the date right now. I think we need to go confirm, but I would say the first or second week

in October, we will try to find a date and make sure all of the parties are aware?

MR. HOWLEY: Yes, we would appreciate that. The East Coast people would appreciate it if you did not have the meeting on Mondays, but other days would be fine.

COMMISSIONER ROSENFELD: Monday, October 10 is a CEC holiday, so we agree with you, Joe.

MR. HOWLEY: Okay, very good.

MR. EILERT: We are now looking at an October workshop. Would you guys care to speculate on when we might have an adoption proceeding?

PRESIDING MEMBER PFANNENSTIEL: What I would like -- if I am actually just plain speculating and not in any way forecasting, I'd like to say that we will have enough progress made by then that we would be able to talk about adoption by the end of the year. I think that would require, just given the processes that you need to go through, we would have to come to that workshop with a lot of agreement.

I think there are big decisions to be made, and I am hoping that we will have enough information by then that even if there is an

agreement that the Energy Commission has enough information to make some decisions. Even if there are not consensus decisions, that we will have the information to make those decisions.

We would all like to think that by then we will be able to reach some consensus on the major points here, and that is what I think we should be working towards. If that doesn't happen, I would still as I say like to have enough information to go forward.

What I really don't want to have happen is to come to an October workshop and find that there is still a lot of information not available or yet to be exchanged or analysis yet to be run because then once again, we are going to have to be making decisions either incomplete or controversial information.

So, that is what I am looking for, and I think the only way that it is going to happen is if we all agree to exchange a lot of information, whether it is through working group meetings in the interim or bilateral discussions or whatever is needed. I don't know how much more strongly to encourage that than I possibly can, but I do.

I think John and Tim need to set up some

working group meetings, you know, several of them between now and then to get all of this information out on the table.

I would also urge that people get in touch with John and Tim and frankly Art and myself if there are issues or if there is questions about where to go. I would hope that the NEMA proposal is something that can be available and circulated maybe before then, even if it is something the full NEMA organization hasn't yet signed off on, but if there are parts of it or ideas of it or concepts that could get out there and technical discussion going on before then, I think that would be very valuable.

We will work, Art and I and the powers that be to set up the hearing date or the workshop date in October and then given that, we are going to work backwards to comments due by and other touch in points, benchmark points, along the way.

Further discussion?

MR. PITSOR: This is Kyle Pitsor form NEMA. I just wanted to assure that in terms of the NEMA organization, we are working with some 25 different manufacturers impacted these both in the lamp ballasts and the fixture industry, and we are

committed to work with staff and the Commission moving forward on this.

We want to make sure that the internal companies can get their act together, review these proposals, but as an industry to get together and bring our proposals back in a timely manner for such an activity in October.

PRESIDING MEMBER PFANNENSTIEL: I appreciate that, and I have to say that it is frustrating for me because I really want to move forward with this, but the information provided here has been really useful, and I appreciate everybody coming here and really working really hard on this.

I know I am seeing here sort of the tip of the iceberg of a lot of work that has been going on. I know that, and I appreciate that, and so bear with me in my impatience as we need to get going and try to resolve some of this.

It does sound to me, and just maybe it is terribly naive to me, but it does sound to me like we are reaching agreement on a lot of the points, and that there is some technical information that still needs to be shared, but towards the goal of reaching an agreement.

MR. PITSOR: Further question. On the issue of (indiscernible) activity on the technical side and on the marketing activity, in as much as some of the technical resolutions and decision making may be impacted a marketing program, how do you foresee that in terms of the October meeting, a workshop on the technical merits?

PRESIDING MEMBER PFANNENSTIEL: I think we need to keep going on the technical stuff, and I think to the extent the marketing questions are fundamental to feeding into that, then we put that marketing needs in that track, and I don't think that is something we are not going to talk about. I think we are going to talk about it, but I just think the first level questions I heard today were the technical ones, so I want to go there.

John?

MR. WILSON: I am just trying to wrap things up I guess. In terms of nailing down the dates in October, how about if people e-mail Tim and I their availability the first two weeks in October.

COMMISSIONER ROSENFELD: The way I heard the discussion, there was some sort of consensus for like Tuesday, the 11th? Not so?

PRESIDING MEMBER PFANNENSTIEL: I'm not sure. I have not checked my schedule for that day, but I think that John's idea is a good one that people exchange or send in to Tim and John any restrictions or preferences they have. We will get that out probably within a week.

MR. WILSON: We could start with the 11th, people could look at the 11th, and then if the 11th doesn't work, we will --

COMMISSIONER ROSENFELD: The only obvious point I am making that Monday doesn't exist for all of us. Tuesday looks okay, Wednesday -- oh, no, there is no business on Wednesday, I'm sorry.

PRESIDING MEMBER PFANNENSTIEL: There is a holiday week, it is one you do tend --

MR. SIMINOVITCH: Is that a national holiday, or just in California.

COMMISSIONER ROSENFELD: Columbus Day in the US.

MR. NADEL: I don't know if there is anybody who is religious involved here, but Yom Kippur is the night of October 12 going into the 13th.

PRESIDING MEMBER PFANNENSTIEL: I think

that is important note to make also. As I say, please let John and Tim know as possible preferences and constraints as the first two weeks in October, and we will try to get a date out by the end of this week.

MR. WILSON: The other thing was in terms of written comments on the case report, you guys have obviously prepared some comments, I am wondering if we could ask for sort of final written comments two weeks from today, something like that.

PRESIDING MEMBER PFANNENSTIEL: That would be great.

MR. WILSON: I just want to agree with what you were saying, Jackie, about having informal meetings, and I want to also thank Dr. Siminovitch for hosting three or four meetings over the last six months. They were very useful for us to sort of get to know the industry and get smarter on technologies. I also want to thank Joe and Pam in particular, we've gotten a lot of frequent flyer miles. We travel a lot anyway, but --

PRESIDING MEMBER PFANNENSTIEL: It won't do you any good if it is United.

MR. WILSON: We will continue in that mode of having meetings and conference calls possibly using the CLTC in Davis as a place for physical meetings, but we are also trying to minimize your amount of travel using conference calls as well.

I think there is a lot of this stuff that is very technical, and I think we need to get into it in more depth than this kind of workshop. Also, I want to make all those meetings inclusive of as many people here who would want to be involved in them.

Some of the meetings that we've had over the last six months have been sort of CEC staff and industry people I just want to open that up to all of the people who want to be involved.

UNIDENTIFIED MALE: If that is okay with you.

PRESIDING MEMBER PFANNENSTIEL: It's perfect.

MR. SIMINOVITCH: I wanted to reiterate that so we are seeing both sides of this would be involved in both interest levels, that it's been very informative having these kinds of meetings. The small group meetings we've had to hear from

the industry and also hear from you folks independently. I would like to really encourage whatever we could do to facilitate that, we would --

PRESIDING MEMBER PFANNENSTIEL: Thank you. Dale asked I think a very important question is how much information does the Energy Commission before we are willing to go forward.

I think the answer is a little more than we have. I'm not yet comfortable, and I think Art would agree that we are not yet ready, but we are hoping that this through the participation of people here that we can get there, and I would like to say get there by the end of this year. That is a goal.

Further discussion?

(No response.)

PRESIDING MEMBER PFANNENSTIEL: Hearing none, we will be adjourned. Thank you all for participating.

(Whereupon, at 1:11 p.m., the workshop was adjourned.)

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CERTIFICATE OF REPORTER

I, PETER PETTY, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission Workshop; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said workshop, nor in an way interested in outcome of said workshop.

IN WITNESS WHEREOF, I have hereunto set my hand this 25th day of July, 2005.